Welcome

On your tables you will find copies of a Key Stage 2 Maths Arithmetic Paper.

This is what we now expect our 11 year olds to be able to complete by the time they leave us.

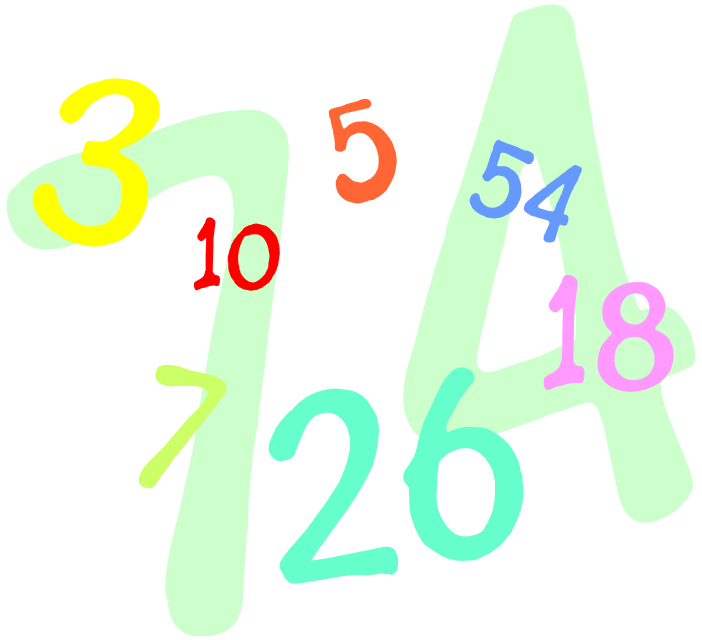
Can you complete the paper?

Have a go while we are waiting for everyone to arrive!

Bledlow Ridge School

Maths Workshop for Parents

23rd November 2016



Aims of the Workshop

- To outline the main changes to the new primary maths curriculum.
- To provide parents with ideas and activities that they can use at home to support children's maths development.
- To outline the clear progression of the four calculation methods and how these are taught at BRS.

Key Aims of the New Maths Curriculum

- **Fluent recall** of **mental maths facts** e.g. times tables, number bonds etc.
- To **reason** mathematically – children need to be able to **explain** the mathematical concepts with number sense; they must explain **how** they got the answer and **why** they are correct.
- **Problem solving** – applying their skills to real-life contexts.

Key Differences of the New Maths Curriculum:

- **Five-year-olds are expected to learn to count up to 100** (compared to 20 under the previous curriculum) and learn **number bonds to 20** (previously up to 10).
- **Simple fractions (1/4 and 1/2) are taught from KS1**, and by the end of primary school, children should be able to convert decimal fractions to simple fractions (e.g. 0.375 = 3/8).
- By the age of nine (Year 4), children are expected to know **times tables up to 12×12**

Good Practice in Maths Today!

Mental calculation skills are vital.
Children need the ability to **estimate**.

e.g. If I have 18 sweets in one bag
and 33 sweets in another bag,
how many do I have altogether?

Children can estimate by adding 20 and 30 and know that roughly the answer should be around 50.

Good Practice in Maths Today!

All children need to learn maths in a **real life context.**

As well as knowing 7x7=49, children need to be able to do the following:

There are 7 fields. Each field has 7 sheep in them.
How many sheep are there in total?

Children need to be able to **explain** how they have calculated or solved a problem.

In the new curriculum, **written calculations** are taught at an earlier age. The mental methods are essential for supporting pupils understanding of these written calculations.

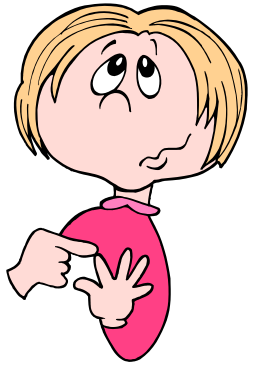
Good Practice in Maths Today!

Connections are made between mathematics topic areas, other subjects and between objectives.

Children are taught to reason mathematically so that they able to consider if their answers are plausible.

Children are taught to consider the most effective calculation method and approach to calculations.

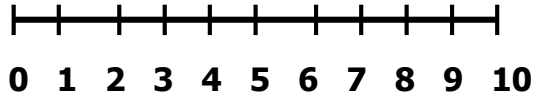
How do children learn the calculation methods?



Counting of objects and mental counting.

Early stages of calculation with learning of addition and subtraction **number facts**, with recording.

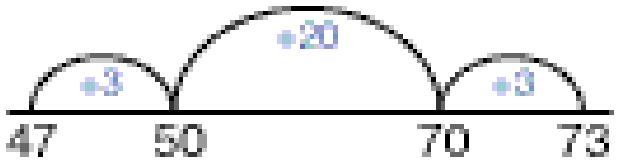
5 + 8 = or 13 = + 5



Work with **structured number lines**

Work with **larger numbers, unstructured number lines** and informal **jottings**.

e.g. 47 + 26



- **Informal written methods**, first with whole numbers and decimals.

Remember to partition

76 + 47 =

76 + 40 +7 =

116 + 7 = **123**

I must remember to add the least significant digit first

- **Formal written methods.**

$$\begin{array}{r} 47 \\ +\ 76 \\ \hline 123 \\ \hline {\scriptstyle 1\ 1} \end{array} \qquad \begin{array}{r} 368 \\ +493 \\ \hline 861 \\ \hline {\scriptstyle 1\ 1} \end{array}$$

$$\begin{array}{r} 368 \\ +493 \\ \hline 11 \\ 150 \\ 700 \\ \hline 861 \end{array}$$

(8+3)

(60+90)

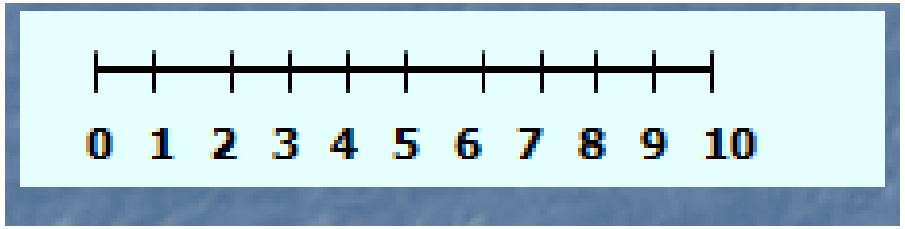
(300+400)

- With any calculation, teach children to **consider first whether a mental method is appropriate and remembering to estimate first.**

Addition

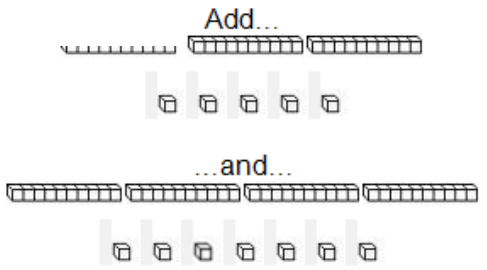
- Practical addition of real objects.

- Use of a structured number line to add.



- Partitioning to add.

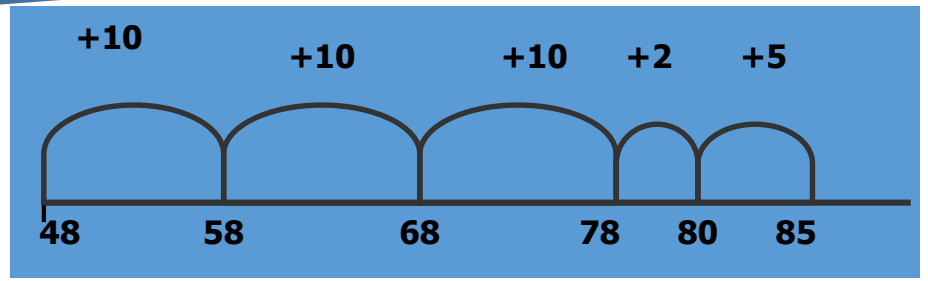
By partitioning and recombining
30+ 40 = 70
5 + 7 = 12
70 + 12 = 82

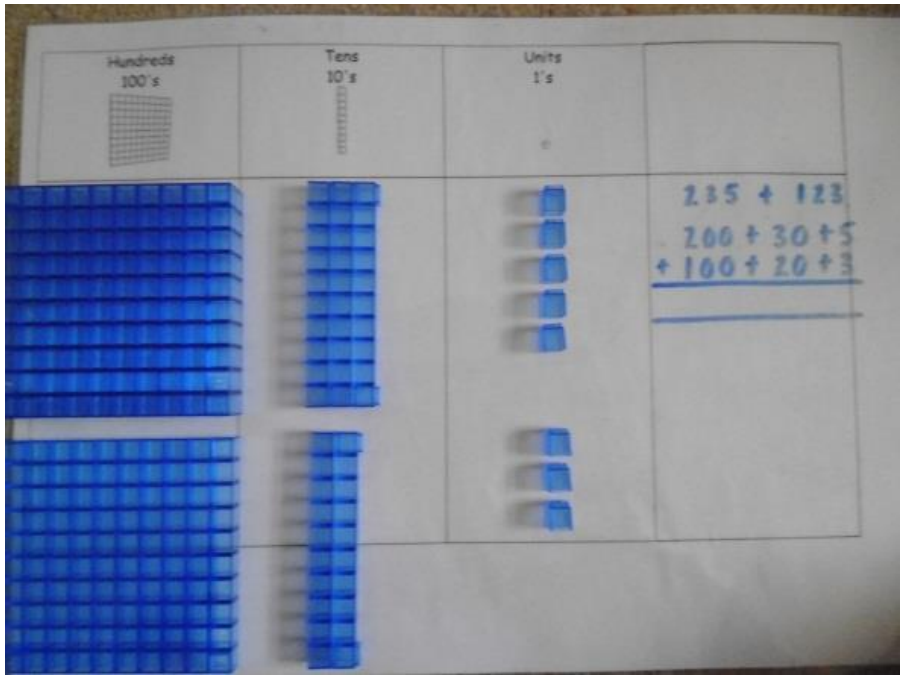


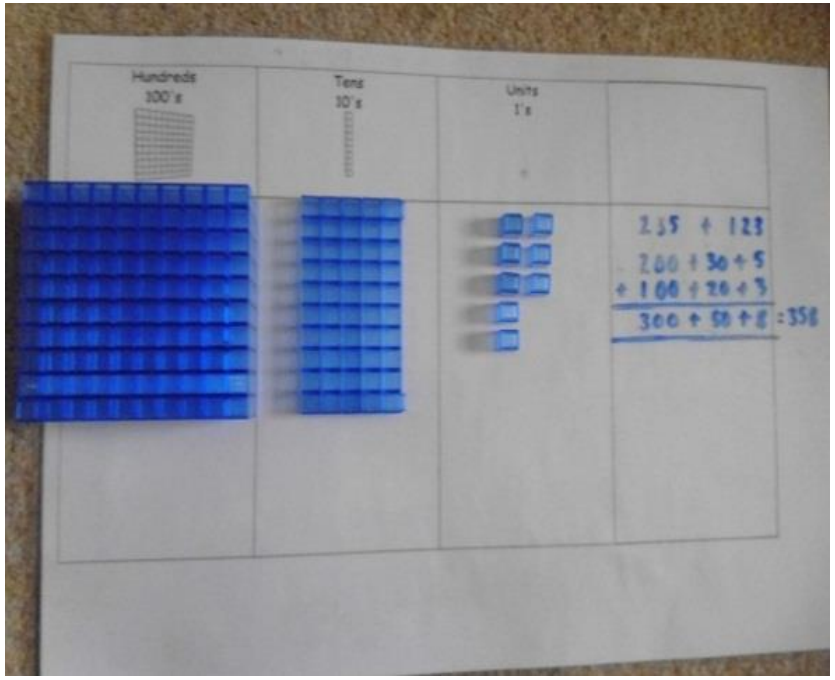
Addition continued…

Use of an unstructured number line.

Expanded horizontal method, leading to columnar addition.

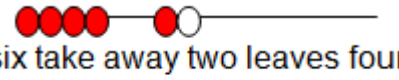






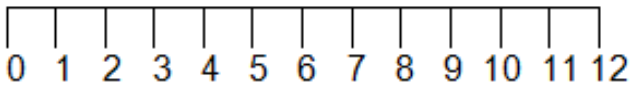
Subtraction

- **Subtraction as taking away from a group:**

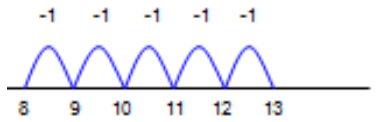


- **Subtracting by counting back and on:** children begin to use numbered lines to support their own calculations, initially counting back in ones before beginning to work more efficiently.

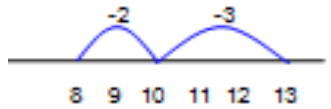
Number line with all numbers labelled



13 – 5 = 8



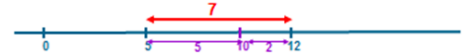
13 – 5 = 8



- **Finding the difference by either counting on or back.**

Comparing two sets: comparison or difference.

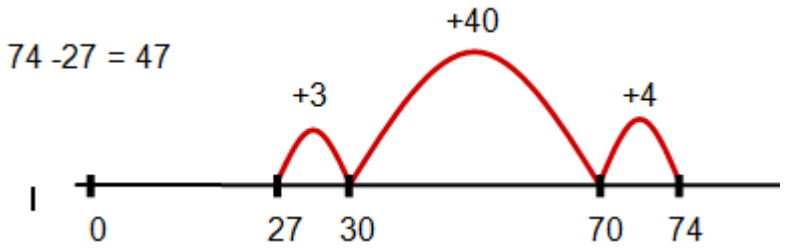
Finding the difference on a number line.



Note: Finding the difference is often the most efficient way of solving a subtraction problem,
e.g. 61 – 59
2,003 – 1,997

Subtraction continued…

- **Subtracting TU – U and TU – TU:** use of an **unstructured number line**.
- Use empty number lines to find the difference by bridging through multiples of ten.



- Subtract by starting with the first number and partitioning the second, i.e.

74 - 27

74 – 20 = 54
54 – 4 = 50
50 – 3 = 47

Subtraction continued…

- **First stage of column method, including expanded method:**
- Written recording should follow teacher modelling around the size of numbers and place value using a variety of concrete materials, e.g. straws, Dienes and place-value cards.

363 – 147 = 216

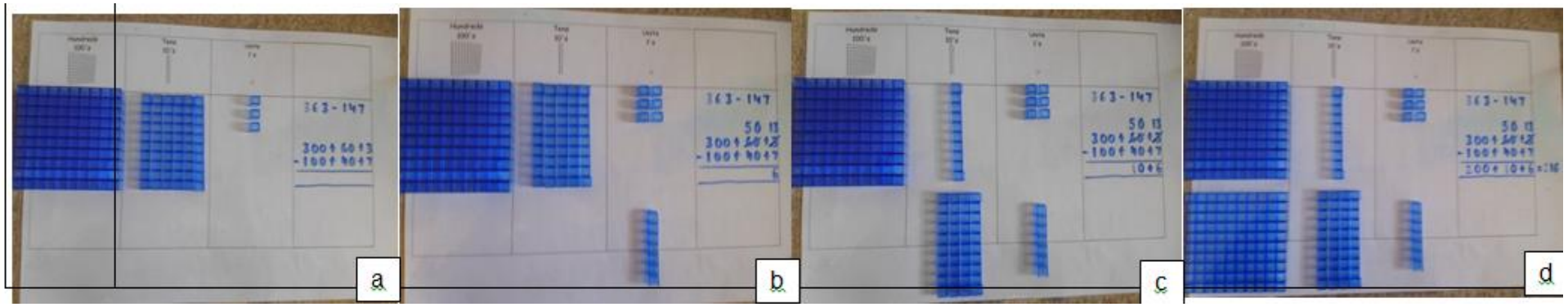
50 13

~~300~~ + ~~60~~ + 3

100 + 40 + 7

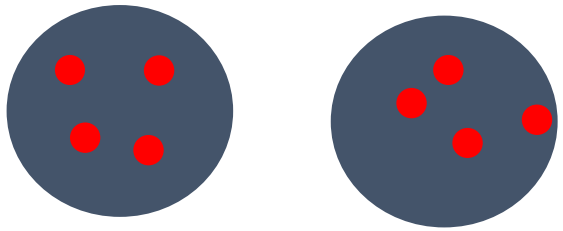
200 + 10 + 6 = 216

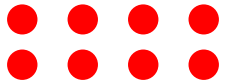
Illustration of how to use Dienes equipment to ensure children understand transference of numbers when using columnar subtraction.

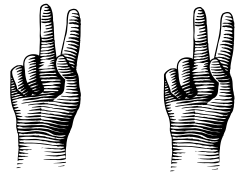


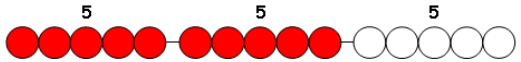
Multiplication

1.Developing early conceptual understanding of multiplication: practical multiplication - 2 x 4 2 lots of 4.

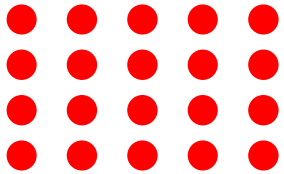


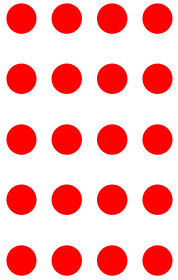






2. Understanding multiplication as repeated addition: use of arrays and number lines. 4 x 5

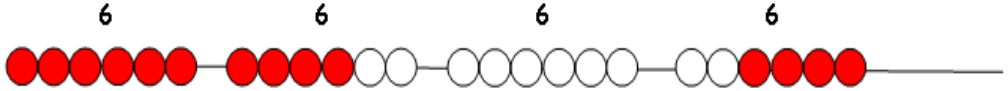




Number lines:

6 X 4 = 24

So: ‘Six taken four times”

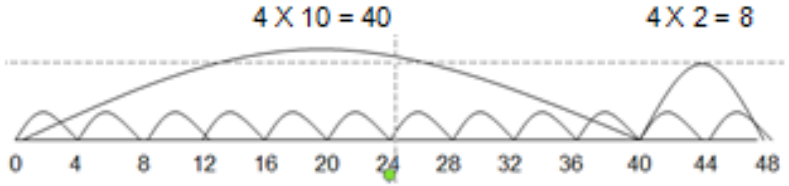


Multiplication

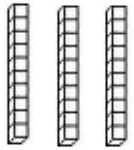
3. Relate multiplying a 2-digit by 1-digit number using repeated addition and arrays to represent

Children use an empty number line to chunk efficiently:

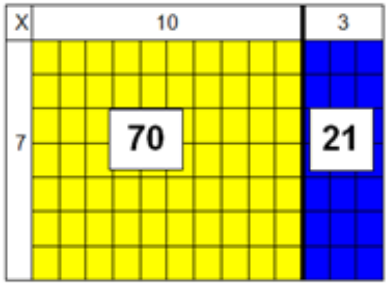
4 X 12 = 48



3 X 13 = 39

X	10	3
3		

Relate multiplying a 3/2-digit by 1-digit number, now also setting it out as short multiplication.



7 X 13 = 91

7 X 10 = 70
7 X 3 = 21
= 91

4. Relate multiplying a 3/2-digit by 1-digit number with arrays towards using long/short multiplication

Multiplication

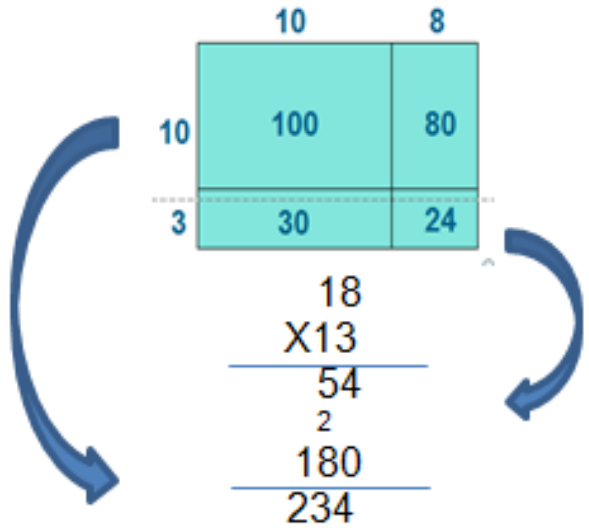
5. Relate multiplying a 4/3/2-digit by 1/2-digit number with grid to using long multiplication.

×	30	5
20	600	100
6	180	30

600 + 100 = 700

180 + 30 = 210

700 + 210 = 910

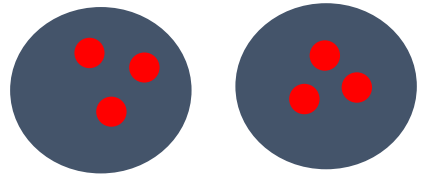


6. Relate multiplying a 4/3/2-digit by 1/2-digit number with grid to using short multiplication.

Division

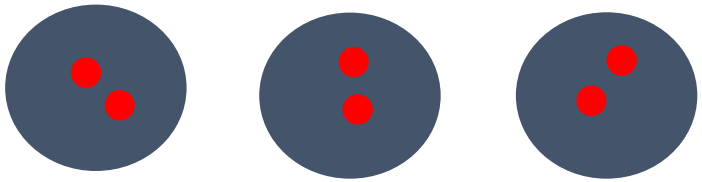
1.Sharing or Grouping – Division is initially represented pictorially.

6 ÷2 = 3



6 sweets **shared** between 2 people. How many each?

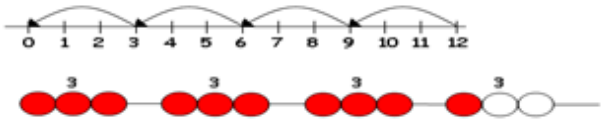
There are 6 people in a room. Put them into **groups** of 2.
How many groups can you make?



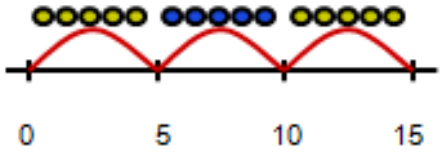
2. Using a number line and arrays to show division.

Number lines and arrays:

12 ÷ 3 = 4



15 ÷ 5 = 3

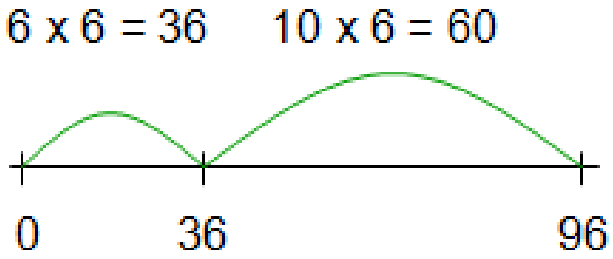


Division continued…

3. Dividing a 2-digit by 1-digit number, representing this efficiently on a number line.

Children use an empty number line to chunk efficiently.

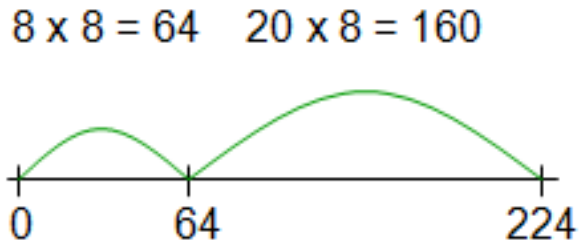
96 ÷ 6 = 16



4. Dividing a 3/2-digit by 1-digit number, representing this efficiently on a number line, also in relation to long division

Children use an empty number line to chunk efficiently.

224 ÷ 8 = 28




```
   28
8 | 224
  - 160   (8 X 20)
    64
  -  64   (8 X 8)
     0
```

…or…

```
      28
   8 | 224
20 X 8 = 160
      64
 8 X 8 =  64
       0
```

Division continued…

This leads on to the more familiar "bus stop" method:

362 ÷ 7 =

$$\begin{array}{r} 5\ 1\ r5 \\ 7\ \overline{)\ 3\ 6\ {}^{1}2} \end{array}$$

362 ÷ 7 = 51 r5

Remainders should be interpreted in the following way when short division is used:

- through rounding in an appropriate way to the context

Long division:

432 ÷ 15 = 28 4/5

$$\begin{array}{rr} & 2\ 8 \\ 1\ 5 & \overline{)\ 4\ 3\ 2} \\ - & 3\ 0\ 0 \quad 15\times20 \\ \hline & 1\ 3\ 2 \\ - & 1\ 2\ 0 \quad 15\times8 \\ \hline & 1\ 2 \end{array}$$

$\frac{\cancel{12}}{\cancel{15}} = \frac{4}{5}$

Answer: $28\ \frac{4}{5}$

Other ideas…

The Bar Model

- This is a relatively new idea to us but it has been growing in popularity since its introduction from the Far East.

Other ideas…

In a class, 18 of the children are girls.
A quarter of the children in the class are boys.
Altogether, how many children are there in the class?

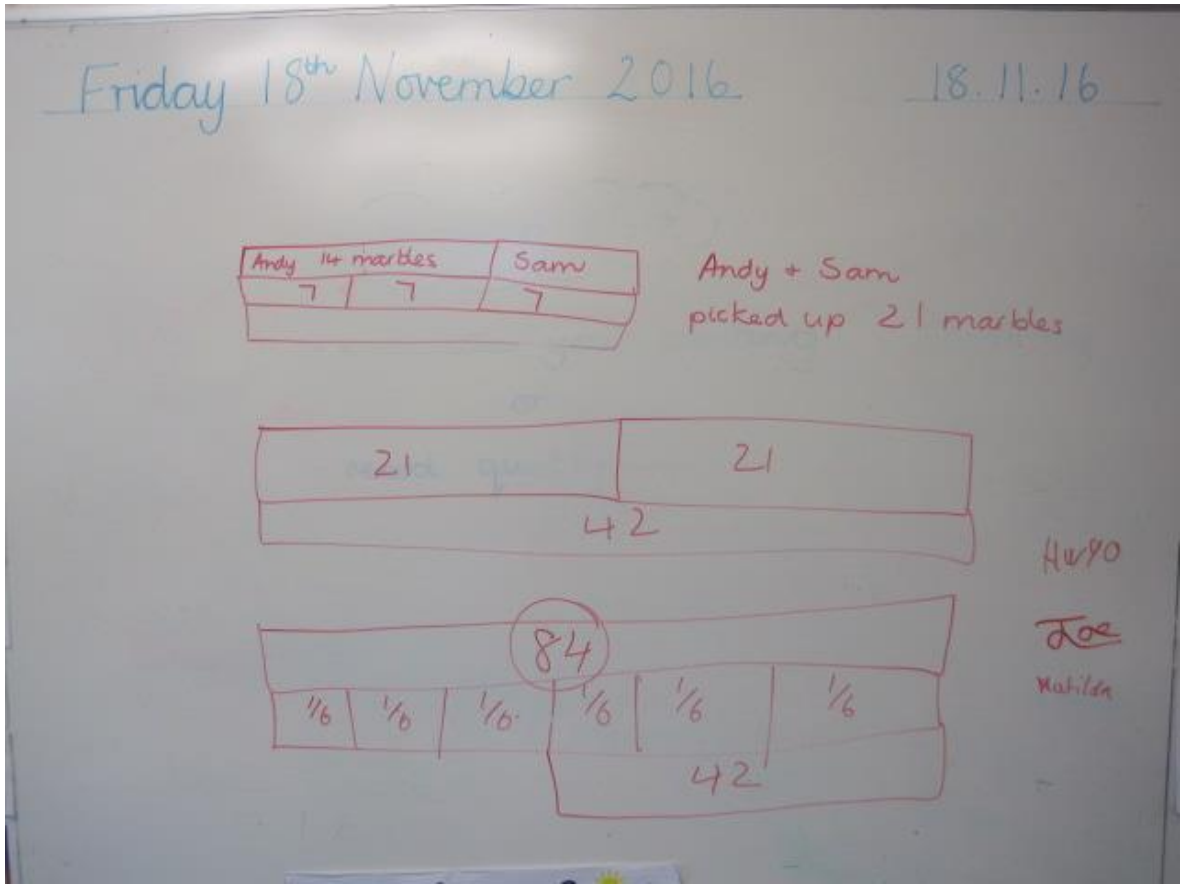
(Key Stage 2 SATS 2012 – old curriculum)

Other ideas…

How does the bar model help?

- The bar represents the whole class.
- One quarter are boys so three quarters must be girls.
- This means three quarters is equal to 18.

Other ideas…


Friday 18th November 2016
18.11.16
Andy 14 marbles
Sam
7
7
7
Andy + Sam
picked up 21 marbles
21
21
42
84
1/6
1/6
1/6
1/6
1/6
1/6
42
Hugo
Zoe
Matilda

Final Challenge!

Can you solve this problem?

Ralph posts 40 letters, some of which are first class and some of which are second class.

He posts four times as many second class letters as he does first.

How many of each does he post?

Final Challenge!

And that was a GCSE higher paper question!

I hope you have found this evening useful and enjoyable.

Safe journey home!