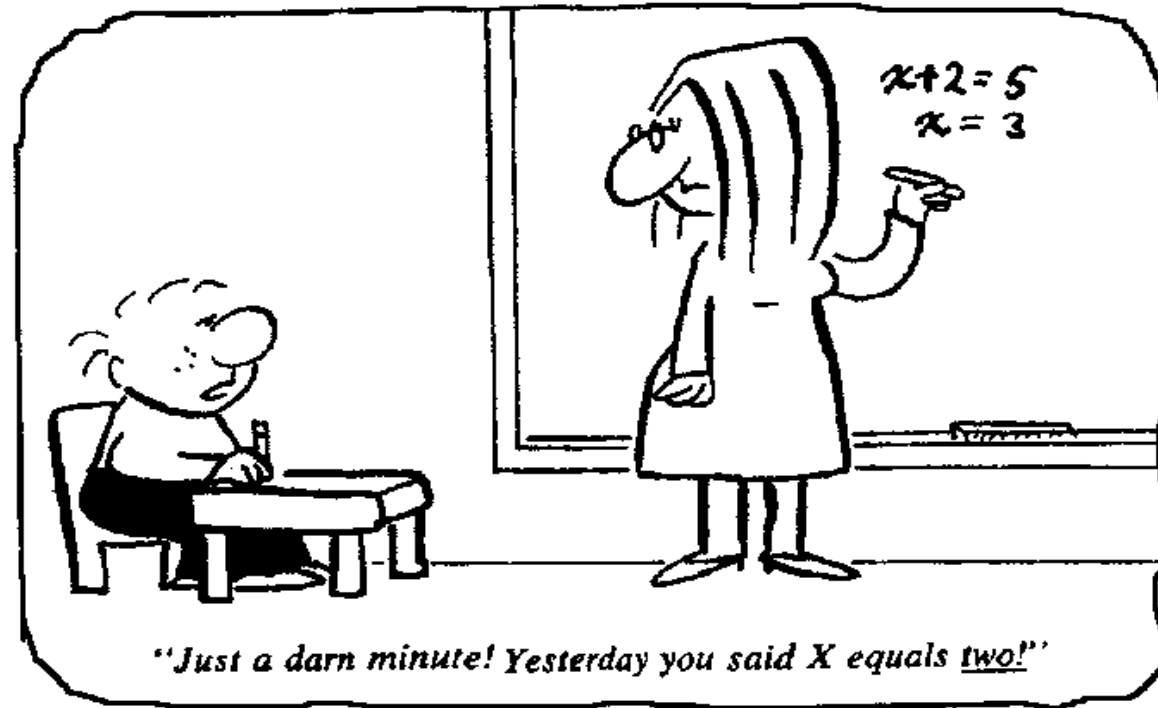


St Alphege CEI School Maths Workshop for Parents



Aims of the workshop

Over the course of the workshop, we will be thinking about:

- our own experiences of maths
- considering the difficulties children might encounter when learning maths
- the key features of maths teaching in EYFS and Key Stage 1
- ideas you can use at home to support children's maths development.

What do we think about maths?

Activity One

- What do you think of when you hear the word 'maths'?
- Think back to your own experiences of learning maths.

Which of these words would
you use to describe Maths?

Exciting

Useful

Scary

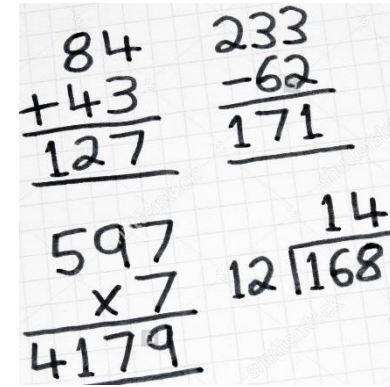
Boring

Easy

Difficult

How things have changed

- In the 1980s and 90s, a lot of time was given to practising methods.



Handwritten arithmetic problems on grid paper:

$$\begin{array}{r} 84 \\ +43 \\ \hline 127 \end{array}$$
$$\begin{array}{r} 233 \\ -62 \\ \hline 171 \end{array}$$
$$\begin{array}{r} 597 \\ \times 7 \\ \hline 4179 \end{array}$$
$$12 \overline{)168} \begin{array}{l} 14 \\ \hline \end{array}$$

- Research showed that children found certain methods difficult, forgot them quickly and made persistent errors.
- The days of maths lessons being pages of endless sums done in silence, are for the most part gone.

How did we used to do it.....?

- Think back to how you tackled long multiplication
- Consider the following using the method you were taught in school:


$$25 \times 17 =$$


When you have an answer, think about **how** you did it


What do we learn from this?


- There's always more than one way to work something out!
- Different methods suit different learning styles
- **Today's teaching methods are not just about getting the right answer, but more about understanding how the method you used works and trying to develop children's number sense.**

Select Route **Directions**

- 14:05 **Dalston Kingsland**
-  Take the **Overground** towards Richmond >
- 14:09

- 14:14 **Highbury & Islington**
-  Take the **Victoria** line towards Brixton >
- 14:31

- 14:40 **Vauxhall**
-  Take **South West Trains** towards Hampton Court >
- 15:12

-  **Hampton Court**
 Walk to Hampton Court Palace >
 About 5 mins (80 m)

- 15:17 **Hampton Court Palace**
 Total journey time: 1 hour 12 min >



Good practice in Maths today

The 2014 National Curriculum for maths aims to ensure that all pupils:

- Become **fluent** in the **fundamentals of mathematics**
- **Reason mathematically** by following a line of enquiry... and developing an argument, justification or proof using mathematical language
- Can **solve problems** by **applying** their maths to a variety of problems.

Good practice in Maths today

- Teaching methods have changed – children now learn **how** and **why** a method works, rather than simply the method itself.
- Today's lessons are far more concerned with **investigation** and **collaboration** – lessons are busy and active.
- There is more emphasis on **mental calculation**
- Development of **number sense** is key.
- **Problem solve** in a **real life context** and **apply maths to do so.**

So what makes maths so tricky....?

**On the 3rd of April, I took the number 3 bus to Tesco and
bought 3 Easter eggs.**

Learning to count

- As adults we take our system of counting for granted.
- Very few of us can remember what learning to count was like, so in order to give you an idea, have a go at the following activity:

ALPHABET LAND

Alphabet Land

- Imagine that we are in a new place called Alphabet land.
- In this land, you need to forget what you know about our number system.
- The new number names are a, b, c, d all the way to z, followed by aa, ab, ac, ad etc

Alphabet Land

- So now let's try.....
- Count forwards from L to T
- Backwards from G to A
- Count in Bs
- What number comes before H? After K?
- And now for some calculating...
- $E + B =$
- Double J =

Learning to Count

Learning to count is a complex business. When you start breaking it down, you realise there are many skills to master:

- Children have to learn to say the words, and then that the words must be said in the same order.
- They have to learn that when counting an amount, they have to point to the objects at the very same time as they say the word.
- They have to remember not to skip an object or a word and make sure they don't count the same object twice.

Learning to Count

PLACE VALUE

The value a digit has according to its position within a number.

25

Language for Counting

16 17

11 12

65 78

23 36

And what about when we write them down.....?

**3 OUT OF 2
PEOPLE
— HAVE —
TROUBLE
— WITH —
FRACTIONS**

Current expectations

- **Content** has generally become **more challenging** and **expectations** have been **raised**.
- **Fewer things** in **more depth** – ‘**mastery**’
- Firmer foundations with **less acceleration**
- **Earlier** and more **challenging requirements** for **multiplication tables**
- More emphasis on **problem solving** and **reasoning**, using **mathematical vocabulary** to **communicate, justify or prove**

Mastery

What does it mean to master something?



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 – riding a bike, driving a car
- I'm really good at doing it.
- I can show someone else how to do it



Anytime, Anyplace, Anywhere

Mastery

‘acquiring a deep, long-term, secure and adaptable understanding of the subject... at any one point in a pupil’s journey through school, **achieving mastery is taken to mean acquiring a solid enough understanding of the maths that’s been taught** to enable him/her move on to more advanced material’

www.ncetm.org.uk/resources/49450.

Answering in full sentences

<https://www.ncetm.org.uk/resources/49824>

Curriculum Content Year R

- **Number:** count reliably with numbers from 1 to 20, order numbers, one more or one less than a given number. Use quantities and objects to add and subtract two single-digit numbers, count on or back to find an answer. Solve problems, including doubling, halving and sharing.
- **Shape, space and measures:** children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them.

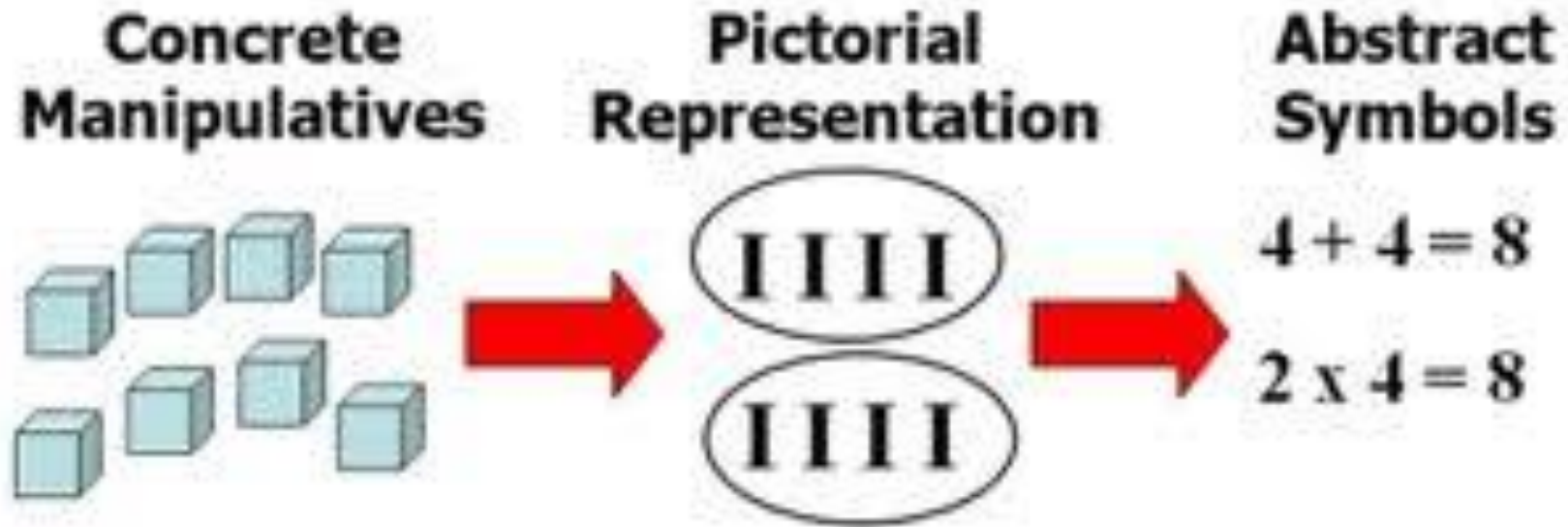
Curriculum Content Year1

- count to 100
- count in multiples of 2,5 and 10 instead of just 2
- multiplication and division problems including using arrays
- fractions including quarters
- volume
- draw hands on a clock face (to show time to the hour/half past)

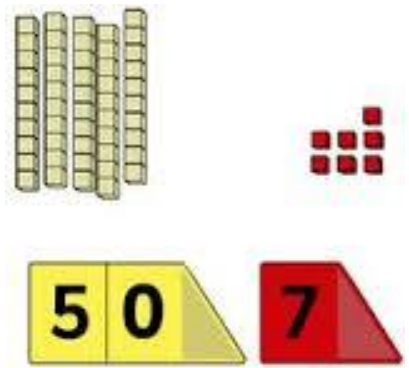
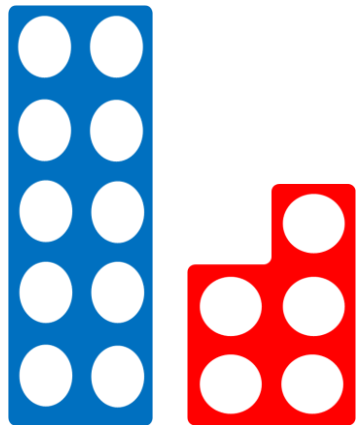
Curriculum Content Year 2

- Use $<$ and $>$ signs
- Higher mental mathematics expectations
- count forward or backward (in steps of 2, 3, 5, 10)
- use number facts (to 20) to derive and use facts up to 100
- use multiplication/division facts ($\times 2/\times 5/\times 10$), including recognising odd/even numbers
- compare and sequence intervals of time
- Commutative rule
- Inverse operations used to check calculations
- Greater range of fractions
- Use standard measures and read a thermometer

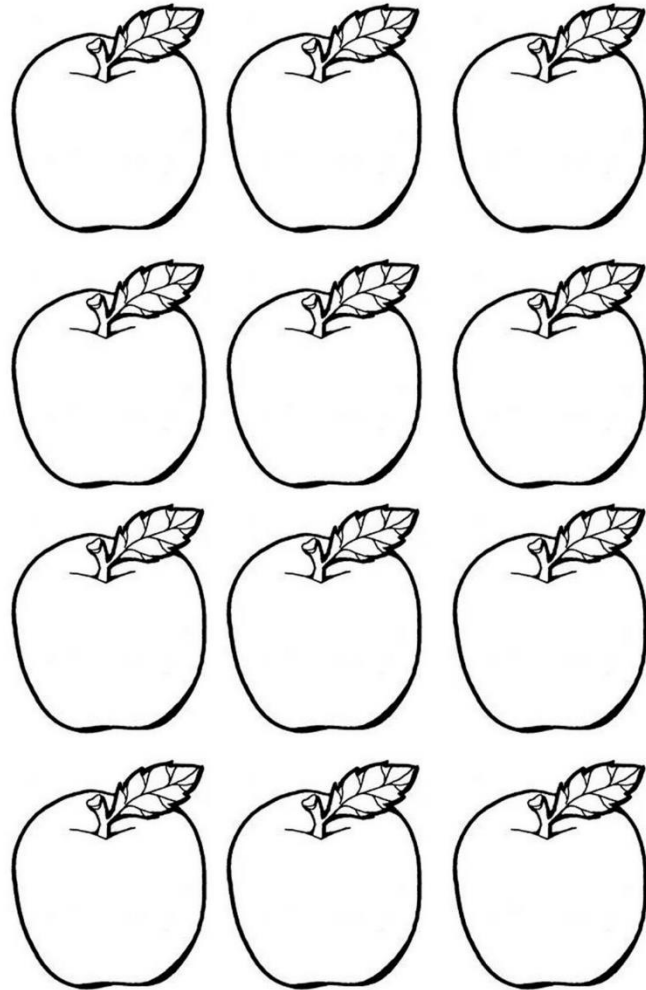
Concrete, Pictorial, Abstract



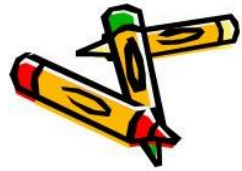
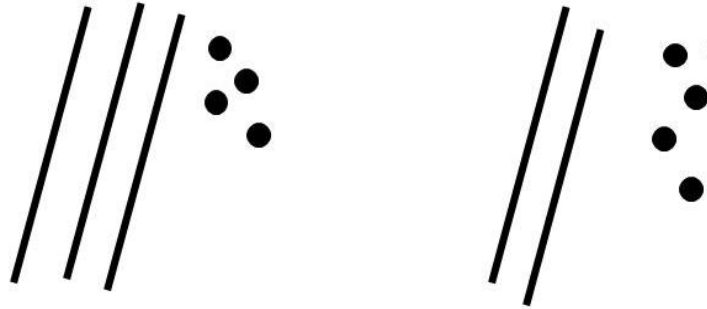
Concrete



pictorial



Jottings



Abstract

$15 + 0 =$

$13 + 3 =$

$11 + 5 =$

$16 + 3 =$

$17 + 2 =$

$19 + 1 =$

$14 + 5 =$

$12 + 5 =$

$12 + 4 =$

$18 + 1 =$

Addition

- In YR, the focus is on the **practical** addition of real objects relating to 'real life' contexts



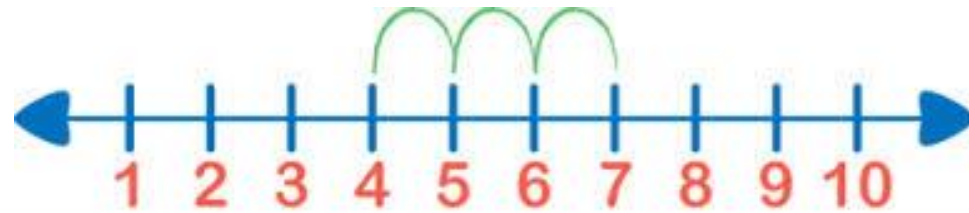
- More / less (particularly 1 more/ 1 less)
- Counting
- Number names, reading & writing numbers to 10
- Vocabulary of addition and +

Addition

- When beginning to learn to add 2 numbers or amounts, most children use a strategy called '**counting all**'
- In Y1 children are taught to relate addition to '**counting on**' and they begin to use a number line alongside practical resources to support addition

Counting on using a number line

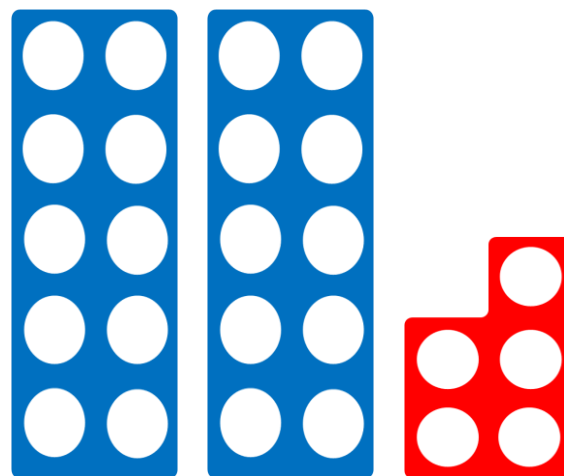
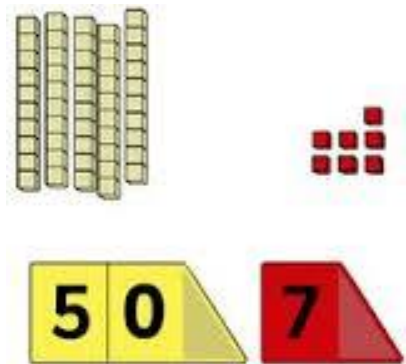
$$4 + 3 =$$



Partitioning

- Splitting a number into its tens and ones (or units as we used to call them) and understanding the worth of each digit.
- In school we use a variety of equipment (known as manipulatives) that illustrates this.

Partitioning



Addition on the 100 square using partitioning

- Once children start to work with 2 digit numbers, partitioning becomes crucial.
- Their previous method of counting in 1s quickly becomes problematic and cumbersome
- Take the number sentence $32+25$ Working this out in 1s on your fingers would take ages

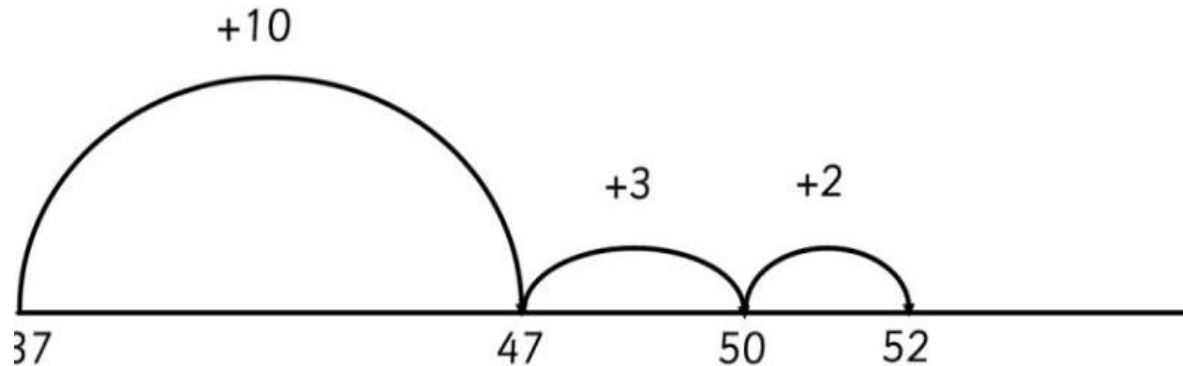
Addition on the 100 square using partitioning

- But using partitioning and the 100 square it becomes a manageable and efficient method and a stepping stone towards calculating mentally and recording formally.
- In order to do this children need lots of opportunities to use the 100 square, moving forwards and backwards, working out what happens when you get to the end of the line, counting in tens, up or back and then in 1s.

Addition

- Printed number lines and 100 squares work for smaller numbers, but as children progress they need a more flexible strategy.
- Meet **'the empty number line'**

$$37 + 15 =$$




Number bonds

- During Year 1, your child will start to learn their number bonds to 10 and then in Year 2 number bonds to 20.
- Really useful facts for your child to learn and remember
- Lots of different manipulatives to help them practise and recall these

Subtraction

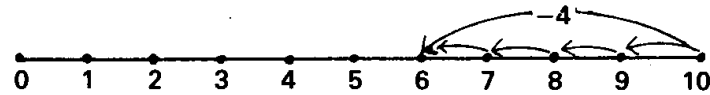
- More complex than addition
- Children are generally more familiar with the concept of more than they are with less.
- Children need to understand the connection between addition and subtraction.
- Subtraction is the **inverse** of addition

Subtraction

- In Year R children relate subtraction to the idea of 'taking away' using 'real life' contexts. 
- Practical activities and discussion
- Basic vocabulary **take away** **subtract** **less**
- Symbol for subtraction and number sentence $5 - 3 =$

Subtraction

- Learning about subtraction in a broader sense.
- Still working with manipulatives
- Using a number line to subtract



Use the number line to subtract 4.

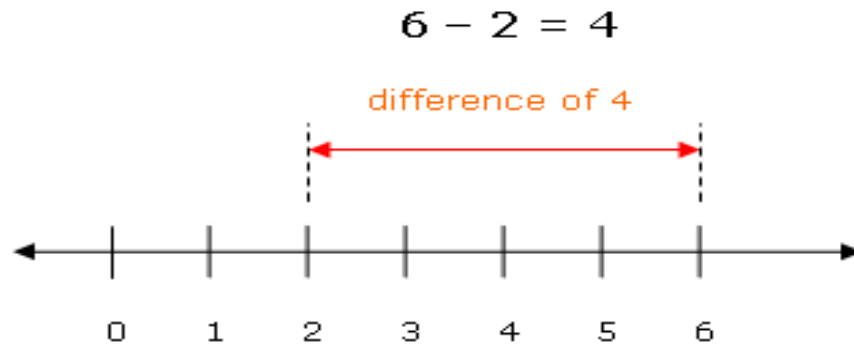
- The number line (and later the 100 square), helps children to use counting back as a means of calculating

Subtraction

- To enable them to work out subtraction number sentences involving larger numbers, children use *partitioning*, as they do with addition.
- This can be done on either the 100 square, or an empty number line.
- $45 - 22 =$

Subtraction as difference

- Early experience of subtraction involves the idea of ‘taking away’.
- But subtraction as difference doesn’t involve anything being ‘taken away’



Subtraction as difference

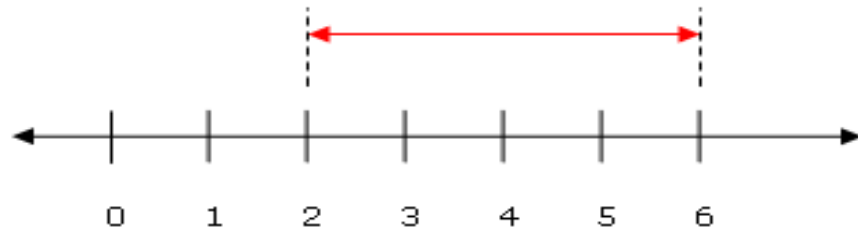
- Consider these examples:
- ‘ I have 15 stickers and my friend has 20. How many more stickers does my friend have than me?’
- ‘A teddy costs £5 and a doll costs £2. What is the difference in these prices?’

Subtraction as difference



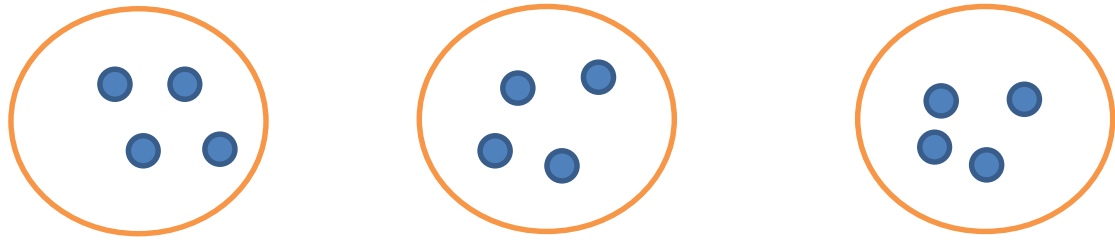
$$6 - 2 = 4$$

difference of 4



Early Multiplication

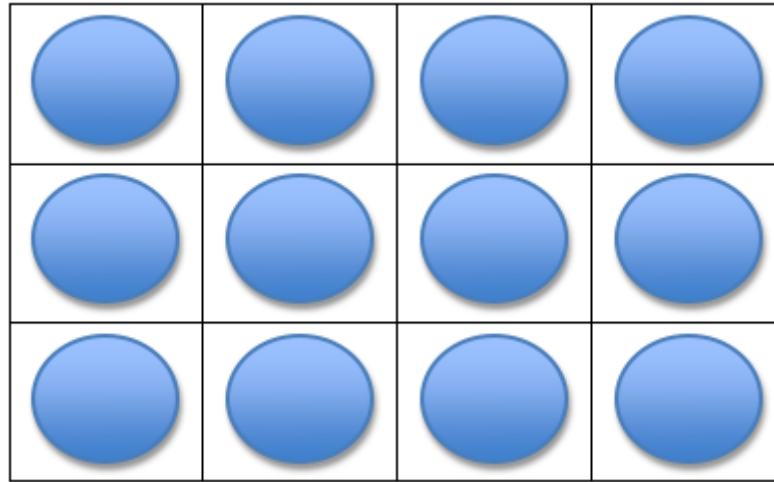
- Multiplication as repeated addition


$$4 + 4 + 4 = 12$$

$$3 \text{ groups of } 4 \quad \text{OR} \quad 3 \times 4 = 12$$

Early Multiplication

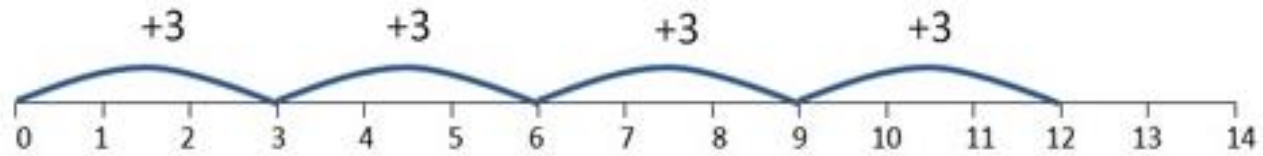
- **Arrays** are useful models for **multiplication**



- An **array** is formed by arranging a set of objects into rows and columns.

4×3 is the same as $3 + 3 + 3 + 3$

or



or



Early Division

- Division is initially done practically using real objects and then manipulatives, and then represented pictorially.
- It can be done by *sharing* eg:
- I have 6 sweets shared *equally* between 2 people. How many sweets will each person get?

$$6 \div 2 =$$



Early Division

.... Or by *grouping* :

I have 12 sweets. I want to put 3 sweets in each party bag. How many bags will I need?

How many groups of 3 can I make from a set of 12?

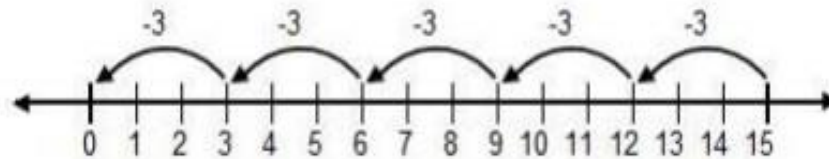
Grouping and sharing are two different mathematical structures.

Early Division

Division can also be shown as repeated subtraction on a number line:

Repeated Subtraction

$15 \div 3 = 5$ is the number of times
you can subtract 3 from 15 before you get to 0.



$$15 - 3 - 3 - 3 - 3 - 3 = 0$$
$$15 \div 3 = 5$$

What can we do at home?

- Counting
- Games
- Shopping
- Cooking
- Using the internet

(See handout for details)

HAVE FUN! 😊