Maths In The Early Years Foundation Stage

Learning In The Early Years Foundation Stage

There are essentially three main types of learning within the Nursery and Foundation Stage setting. Most activities a child does will fall somewhere in a spectrum between being totally child- initiated , to being completely adult led:

Child's Choice	**Adult's input**	**Adults' choice**
Child initiated learning	***Adult initiated learning***	***Adult directed learning***
The child chooses where he wants to play and what he wants to play with.	The adult creates an activity or challenge to initiate a response from the children .	The adult sets up a task and asks the children to complete it.

A spectrum of teaching and learning

3-4 years	4-5 years	5-6 years
A mixture of mostly child initiated , some adult initiated and some adult - directed learning is appropriate	Adult initiated learning and guided learning become an important feature of the school day alongside time to apply and initiate their own learning	Moving towards more adult directed learning but ensuring children have plenty of opportunity to have input into the direction their learning takes and to take ownership of the activities they do.

A spectrum of teaching and learning

There are certain skills and facts that are best learned by direct teaching from an adult. There are particular skills where adult directed is far the more efficient way to learn.

“Children are born ready, able and eager to learn. They actively reach out to interact with other people, and in the world around them. Development is not an automatic process, however. It depends on each unique child having opportunities to interact in positive relationships and enabling environments.”

Adult Directed Learning

There are areas of mathematical learning which collectively provide a platform for everything children will encounter as they progress through their maths learning at school:

- Counting

understanding that the cardinal value of a number refers to the quantity, or 'howmanyness' of things it represents

- Comparison

understanding that comparing numbers involves knowing which numbers are worth more or less than each other

- Composition

understanding that one number can be made up from (composed from) two or more smaller numbers

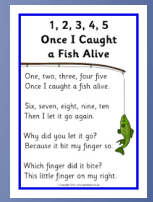
- Vocabulary

- Number formation

Counting

Saying number words in sequence – forwards and backwards, starting from different numbers

Children need to know number names, initially to five, then ten, and extending to larger numbers, including crossing boundaries 19/20 and 29/30. Counting back is a useful skill, but young children will find this harder because of the demand this places on the working memory.



- counting forwards and backwards, for example *number rhymes*
- starting from different numbers.

Counting

Tagging each object with one number word

Children need lots of opportunities to count things in irregular arrangements. For example, how many play people are in the sandpit? How many cars have we got in the garage?

- counting things of different sizes – this helps children to focus on the numerosity of the count
- counting things that can't be seen, such as sounds, actions, words
- counting things that cannot be moved, such as pictures on a screen, birds at the bird table.

Counting

Knowing the last number counted gives the total so far

Children need the opportunity to count out or 'give' a number of things from a larger group, not just to count the number that are there. This is to support them in focusing on the 'stopping number' which gives the cardinal value.

- playing dice games to collect a number of things

Counting

Subitising – recognising small quantities without needing to count them all

Subitising is recognising how many things are in a group without having to count them one by one. Children need opportunities to see regular arrangements of small quantities, e.g. a dice face. Children also need opportunities to recognise small amounts (up to five) when they are not in the 'regular' arrangement, e.g. small handfuls of objects.

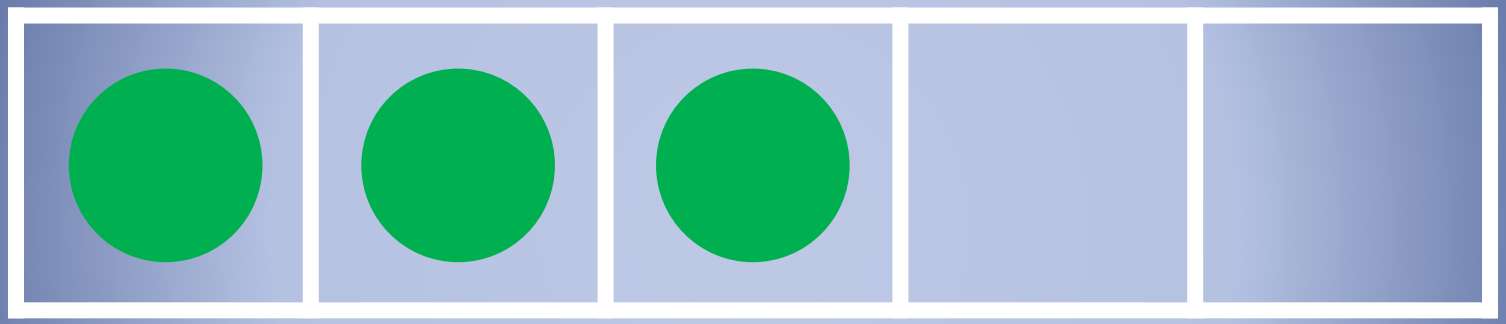
- using dot cards, dominoes and dice as part of a game, including irregularly arranged dots (e.g. stuck on)
- playing hidden objects games where objects are revealed for a few seconds, for example, small toys hidden under a bowl – shuffle them, lift the bowl briefly and ask how many there were
- 'all at once fingers' – show me four fingers.

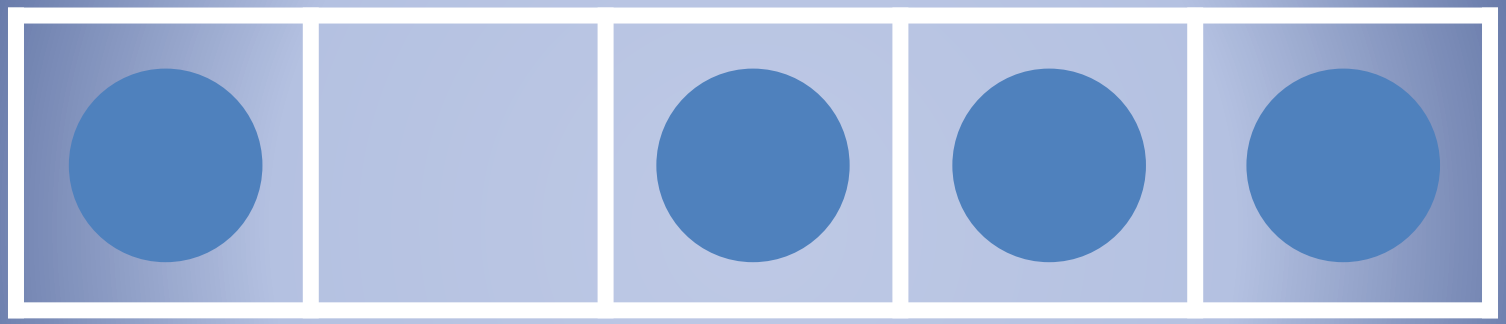
You will see some dots very quickly.
Then they will be hidden.

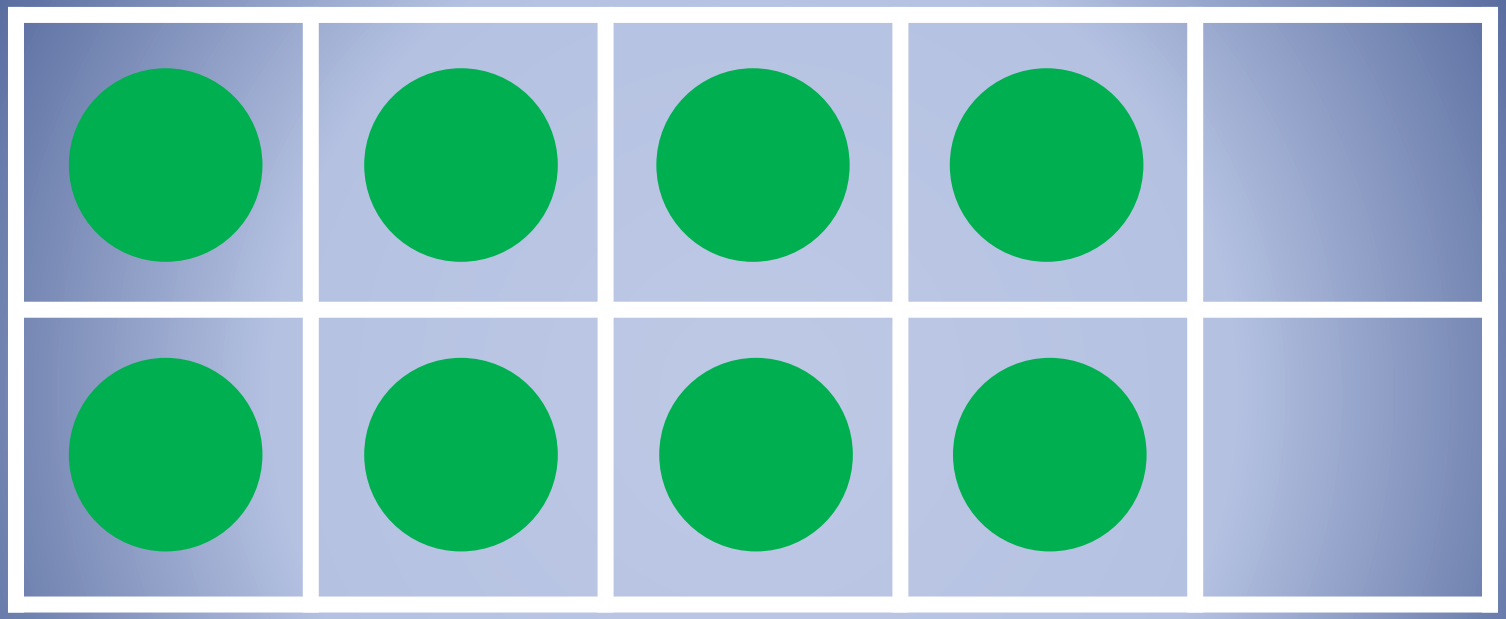
Whisper to your partner:

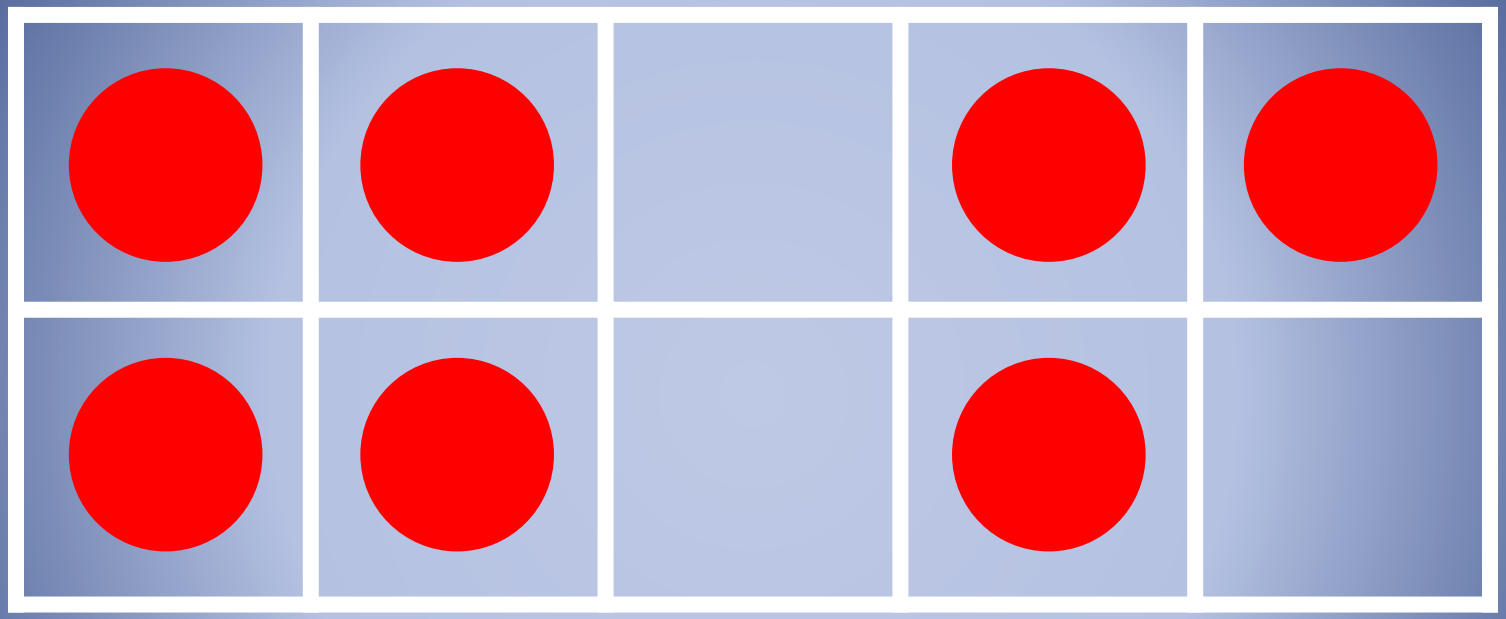
How many dots?

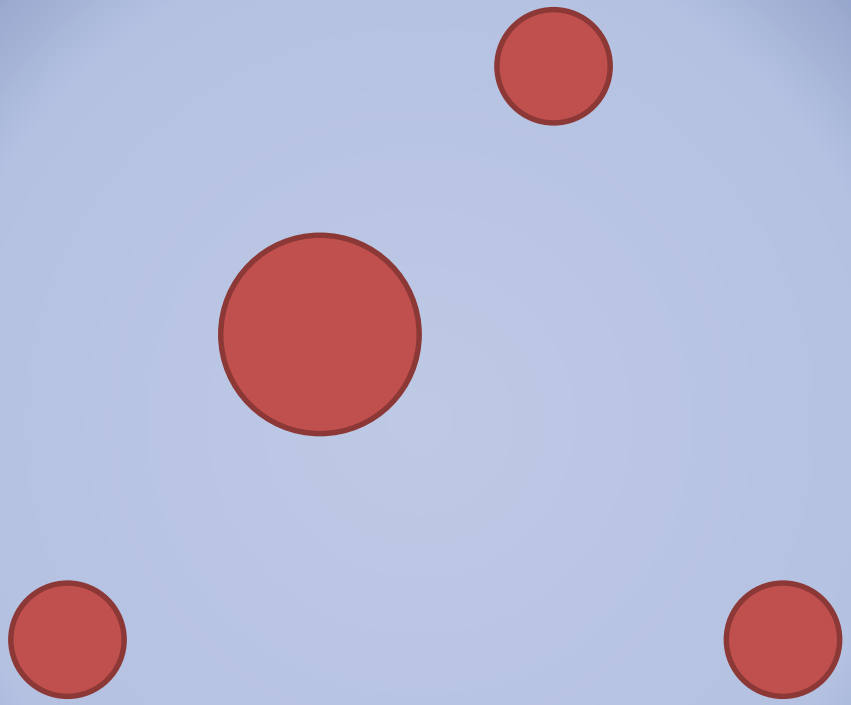
There are 4 pictures.

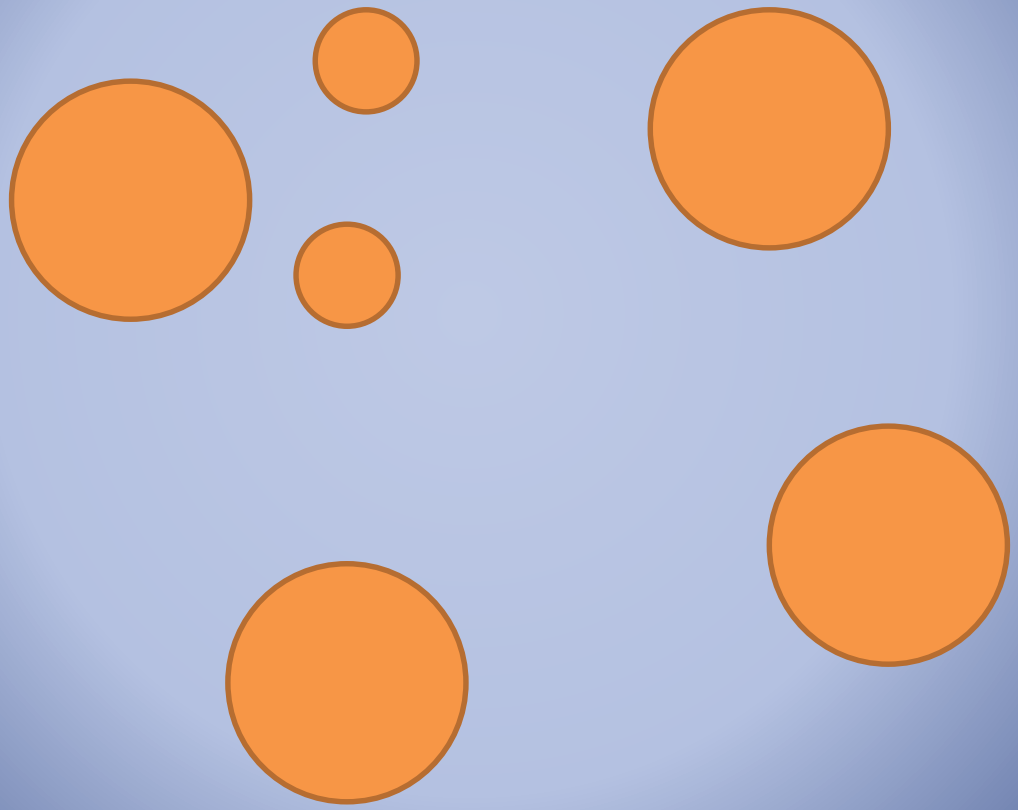


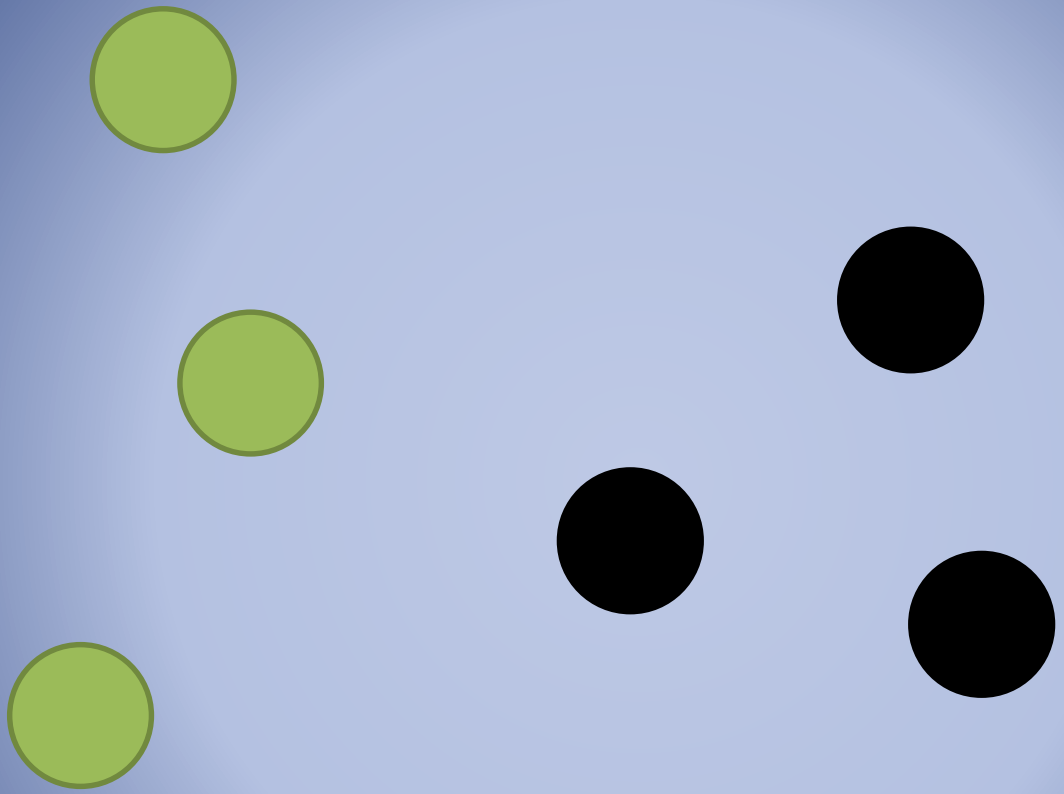










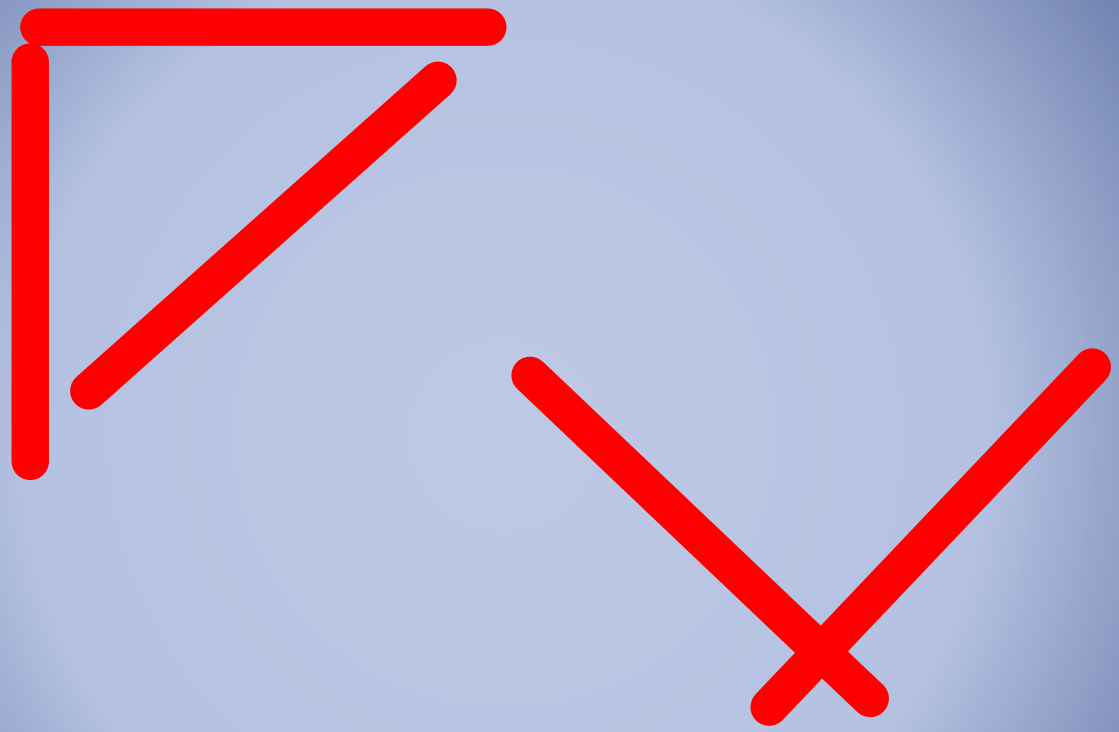


You will see some dots very quickly.
Then they will be hidden.

Whisper to tell your partner:

How many lines?

There are 3 pictures.

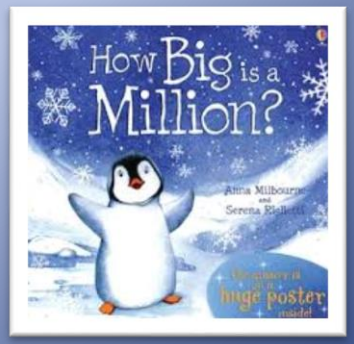


Counting

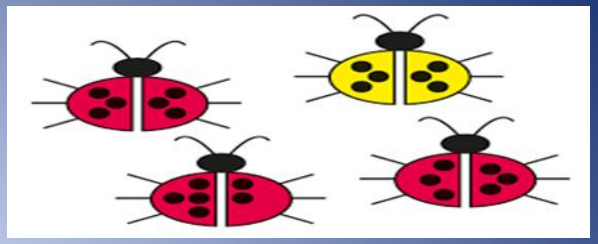
Numeral meanings

Children need to have the opportunity to match a number symbol with a number of things. using numeral dice in games; matching numerals with varied groups of things

- using ‘tidy-up labels’ on containers and checking that nothing is missing
- reading number books
- putting the right number of snacks on a tray for the number of children shown on a card.



Counting



Conservation – knowing that the number is not changed if things are rearranged

Children need the opportunity to recognise amounts that have been rearranged and to generalise that, if nothing has been added or taken away, then the amount is the same.

- correcting a puppet who may say that there are more or fewer objects now, as they have been moved around, e.g. spread out or pushed together
- contexts such as sharing things out (grouping them in different ways) and then the puppet complaining that it is not fair as they have less
- encourage the children to make different patterns with a given number of things

Common Errors May Include....

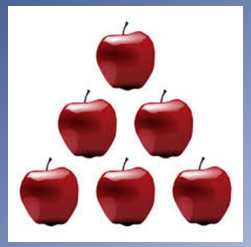
- missing out an object or counting an object twice
- when asked how many cars are in a group of four, simply recounting '1, 2, 3, 4,' without concluding that 'there are four cars in the group'
- when asked to 'get five oranges' from a trayful, a child just grabs some, or carries on counting past five
- when objects in a group are rearranged, the child (unnecessarily) recounts them to find how many there are
- difficulties in counting back
- confusion over the 'teen' numbers – they are hard to learn
- saying three-teen , saying five-teen
- missing out a number (13 or 15 are commonly missed out) or confusing 'thirteen' and 'thirty'.

Comparison

More than/ less than

Children need experiences where they can compare collections and begin to talk about which group has more things. Initially, the groups need to be very obviously different, with one group having a widely different number of things. Collections should also offer challenges, such as including more small things and fewer large things, to draw attention to the numerosity of the comparison, i.e. the number of things, not the size of them.

- collections for children to sort and compare, which include objects which are identical, and which include objects of different kinds or sizes
- collections with a large number of things, and collections with a small number of things

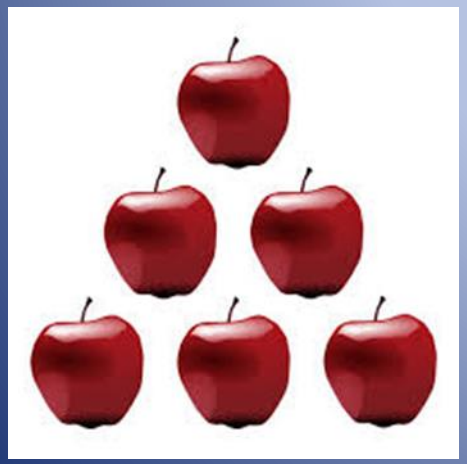


Comparison

Identifying groups with the same number of things

Children need the opportunity to see that groups could consist of equal numbers of things. Children can check that groups are equal, by matching objects on a one-to-one basis.

- ensuring that when providing groups to compare, there are some that have an equal amount
- asking children to convert two unequal groups into two that have the same number, e.g. ‘There are 6 apples in one bag and 2 in another bag; can we make the bags equal for the two hungry horses?’



Comparison

Comparing numbers and reasoning

Children need opportunities to apply their understanding by comparing actual numbers and explaining which is more. For example, a child is shown two boxes and told one has 5 sweets in and the other has 3 sweets in. Which box would they pick to keep and why? Look for the reasoning in the response they give, i.e. 'I would pick the 5 box because 5 is more than 3 and I want more.' If shown two numerals, children can say which is larger by counting or matching one-to-one. Children can compare numbers that are far apart, near to and next to each other. For example, 8 is a lot bigger than 2 but 3 is only a little bit bigger than 2.

- explain unfair sharing - 'This one has more because it has 5 and that one only has 3'
- compare numbers that are far apart, near to, and next to each other.

Comparison

Knowing the 'one more and one less than' relationship between counting numbers

Children need opportunities to see and begin to generalise the 'one more than/one less than' relationship between sequential numbers. They can apply this understanding by recognising when the quantity does not match the number, i.e. if a pack is labelled as 5 but contains only 4, the children can identify that this is not right. Support children in recognising that if they add one, they will get the next number, or if one is taken away, they will have the previous number. For example: 'There are 4 frogs on the log, 1 frog jumps off. How many will be left? How do you know?'

- labelling groups with the correct numeral. Do children spot the error if a group is mislabelled? For example, 'The label on the pot says 4 and we have 5 – what do we need to do?' A child may say, 'We need to take one out because we have one too many.'
- ensuring children focus on the numerosity of the group by having items in the collection of different kinds and sizes
- making predictions about what the outcome will be in stories, rhymes and songs if one is added to, or if one is taken away.

Common Errors May Include....

- children not comparing the numerosity of the group and considering more in terms of size
- children giving a response that does not match the context when estimating a number; e.g. when adding, giving as an answer a number that is smaller than the numbers given. Example: 'There are 7 cars in a garage and then 2 more go in.' The child guesses there are 4 cars in total inside.

Composition

Part part whole: identifying smaller numbers within a number (conceptual subitising – seeing groups and combing a total)

Children need opportunities to see small numbers within a larger collection. 'Number talks' allow children to discuss what they see. For instance, with giant ladybirds: 'There are 7 spots altogether. I can see 4 and 3, I can see 2 and 5. Encourage exploration of all the ways that 'seven' can be and look. Children are encouraged to look closely at numbers to see what else they can see. This reinforces the concept of conservation.

- encouraging making arrangements with (e.g.) ten. Ensure the children talk about the different arrangements they can see within the whole

Composition

Inverse operations

Children need opportunities to partition a number of things into two groups, and to recognise that those groups can be recombined to make the same total. Encourage children to say the whole number that the 'parts' make altogether.

- exploring songs; for example, 'Five Currant Buns' – show that the whole is still five, but some are in the shop and some have been taken away; check throughout that there are still five currant buns
- playing skittles and looking at how many are standing. How many have fallen over? How many are there altogether?

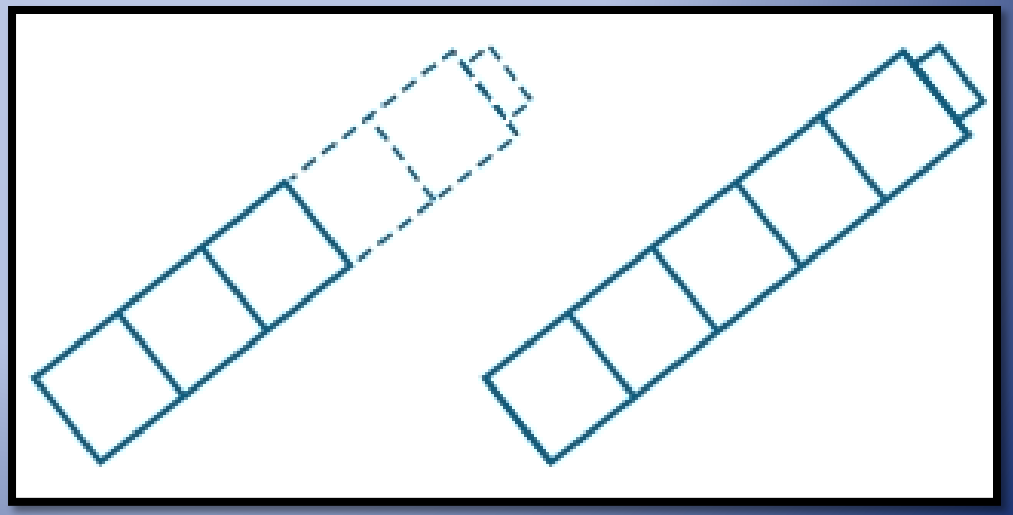
Composition

A number can be partitioned into different pairs of numbers

Children need opportunities to explore a range of ways to partition a whole number. The emphasis here is on identifying the pairs of numbers that make a total. Children can do this in two ways – physically separating a group, or constructing a group from two kinds of things.

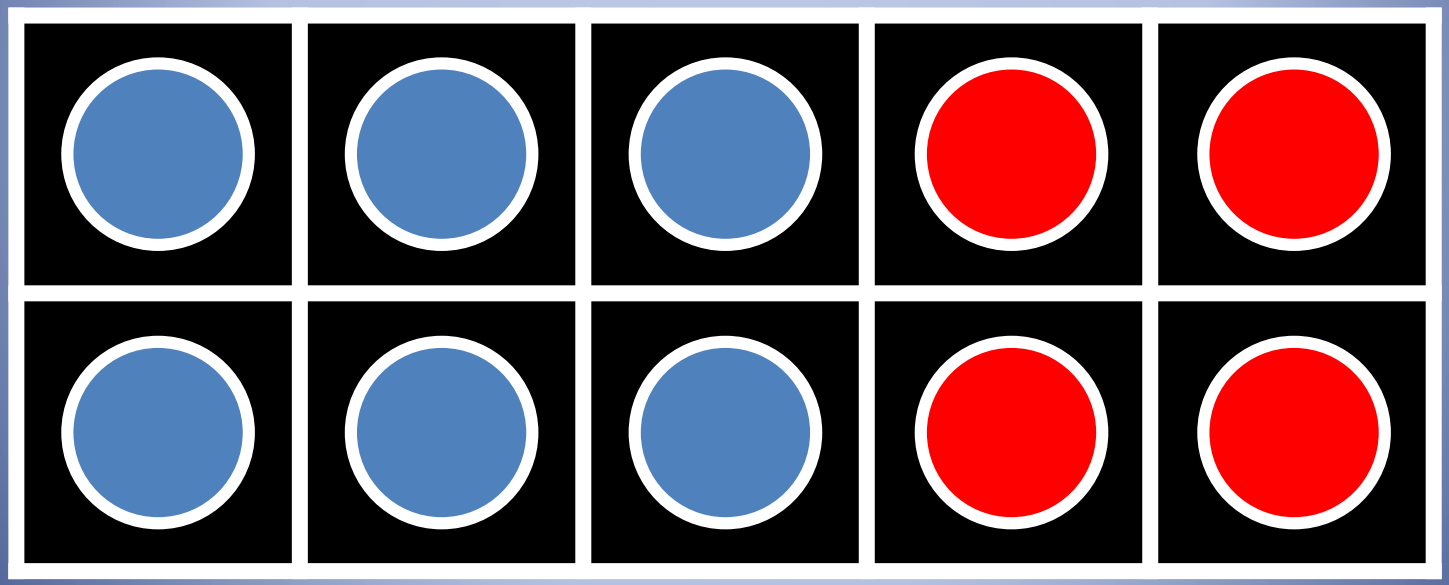
- Numicon towers: layering up Numicon pieces of the same total
- putting things into two containers in different ways
- making a number with two different kinds of things. For example, make a fruit skewer with five pieces of fruit, using bowls of bananas/strawberries to choose from; then ask the children to describe how they have made theirs. They should compare it with a partner's: ‘What is the same about your skewers? What is different?’
- Bunny Ears: using your fingers like bunny ears. 'With two hands, show me five fingers. Can you do it in a different way?' Or, 'Show five fingers altogether with a friend'
- Spill the Beans: using double-sided counters or beans, where one side is coloured, throw the collection and note how many of each type can be seen and how many altogether
- using six bean bags with different fabric on each side, throw the collection and note how many of each type can be seen.

John Hampden School Wendover
Loving to Learn



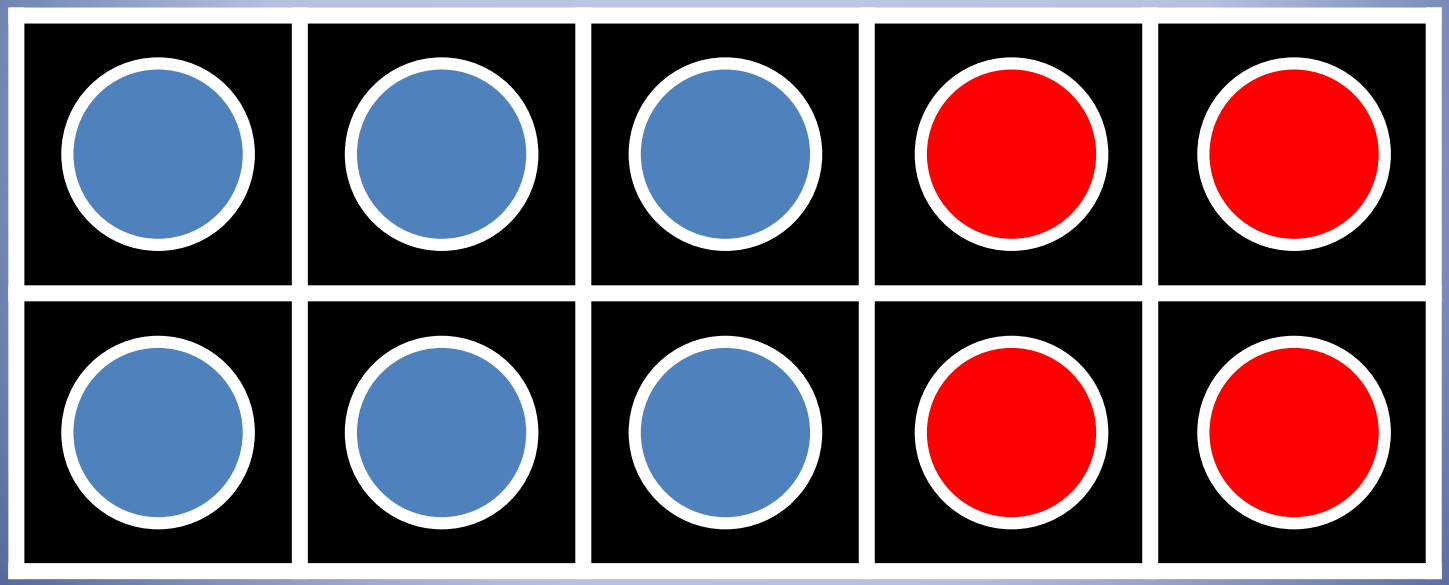
The **whole** is **10**

The **parts** are…



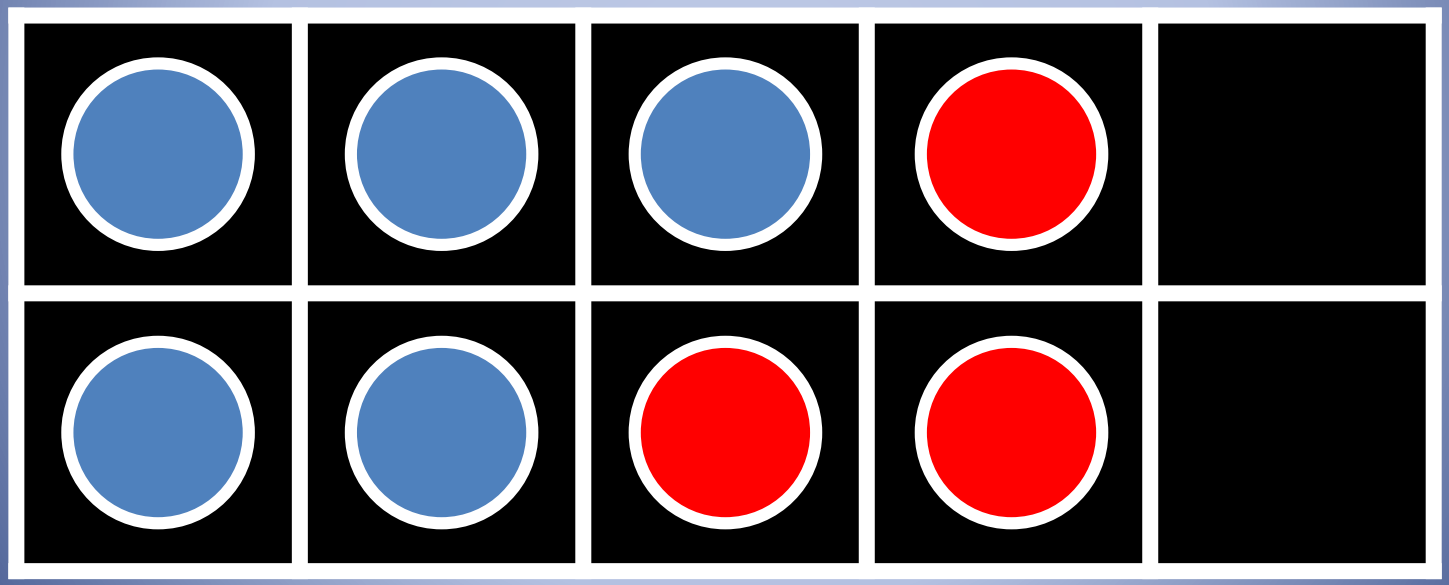
The **whole** is **10**

The **parts** are **6** and **4**



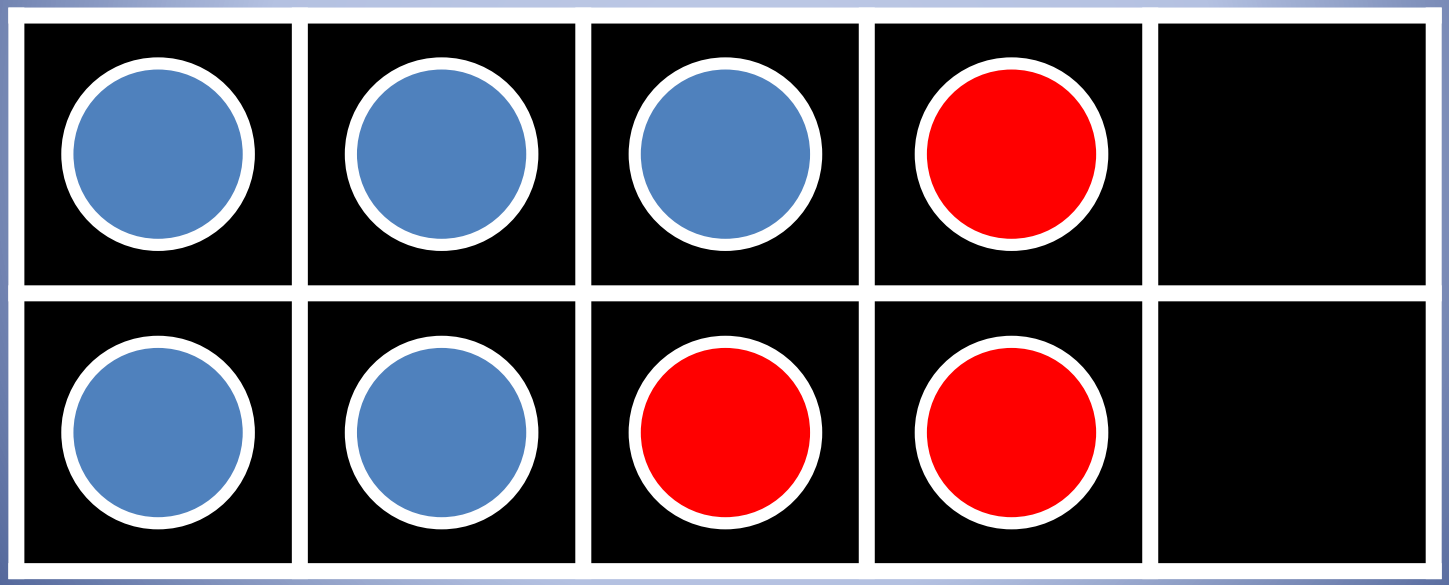
The **whole** is **8**

The **parts** are…



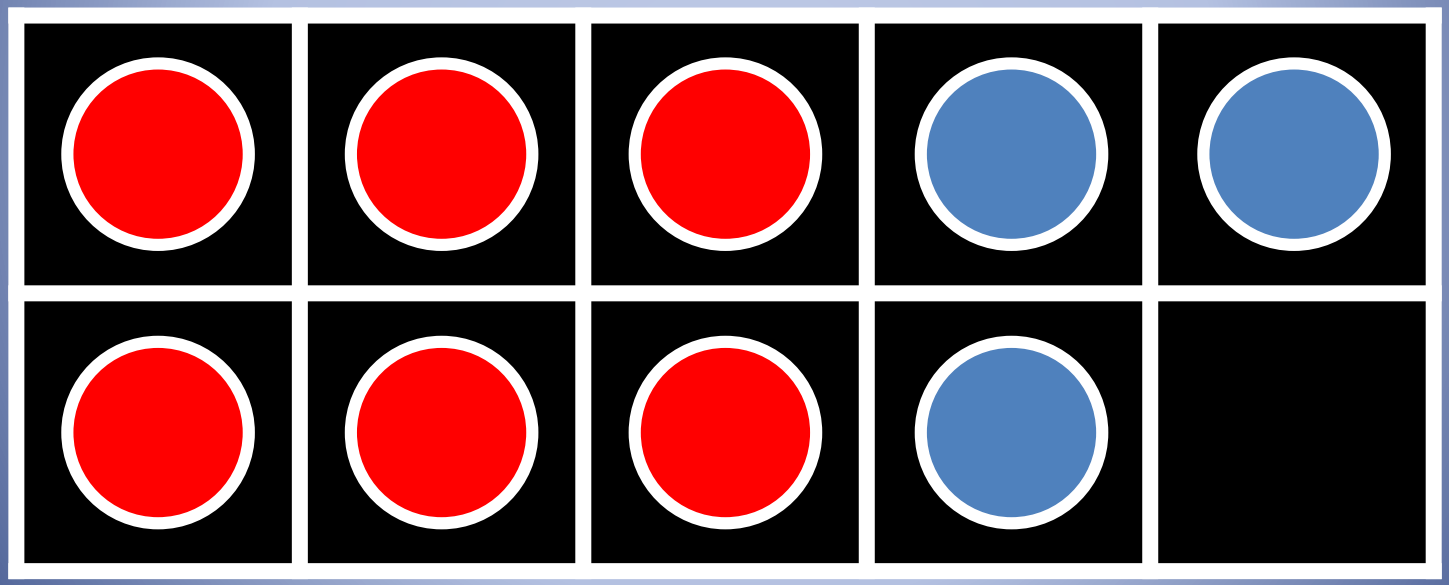
The **whole** is **8**

The **parts** are **5** and **3**



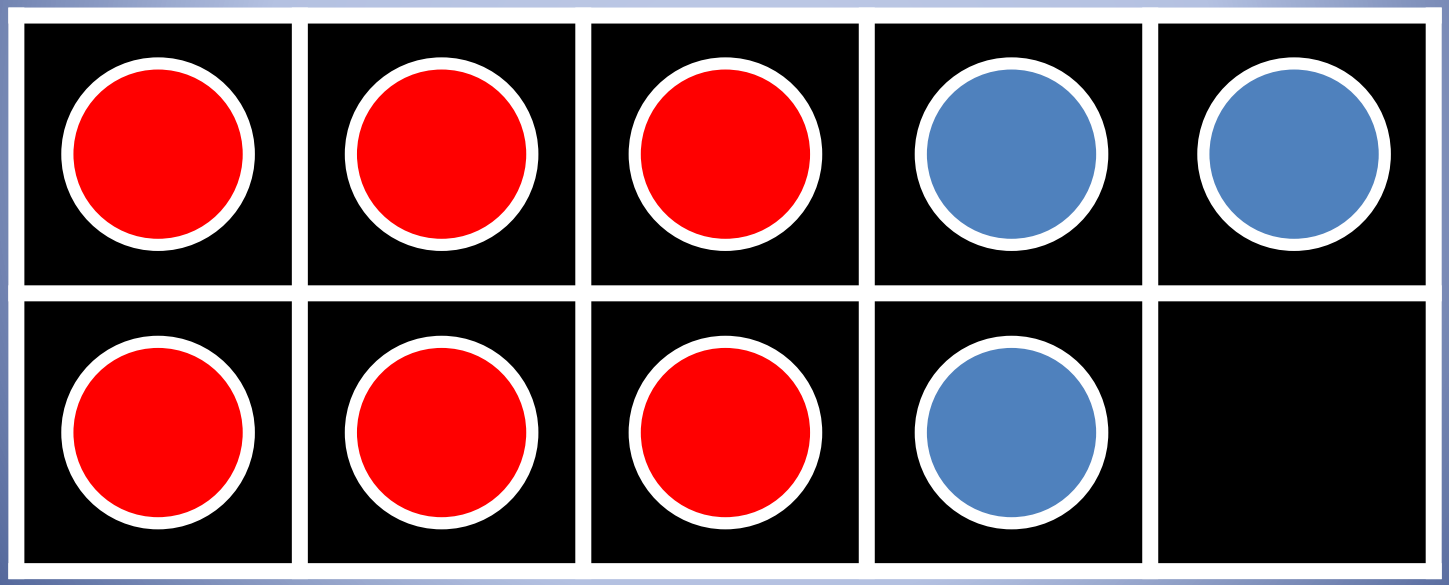
The **whole** is **9**

The **parts** are…

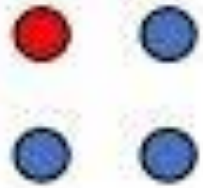


The **whole** is **9**

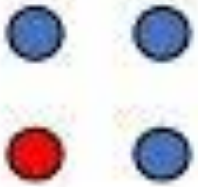
The **parts** are **6** and **3**



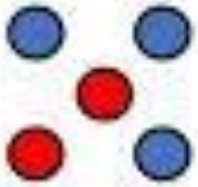
The **whole** is...
The **parts** are...



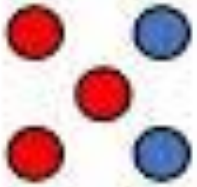
The **whole** is...
The **parts** are...



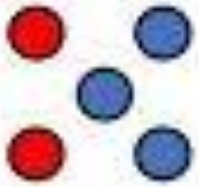
The **whole** is...
The **parts** are...



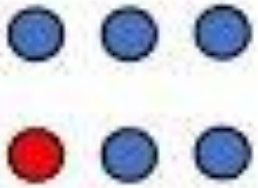
The **whole** is...
The **parts** are...

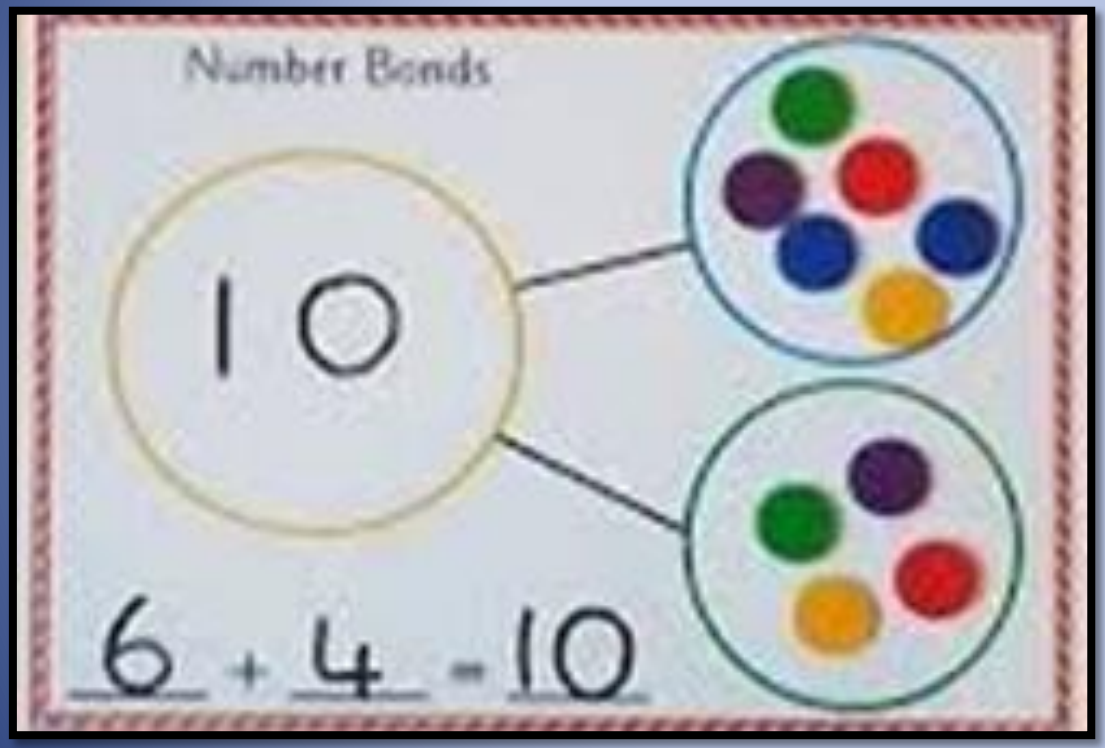


The **whole** is...
The **parts** are...



The **whole** is...
The **parts** are...




Number Bonds
10
6 + 4 = 10

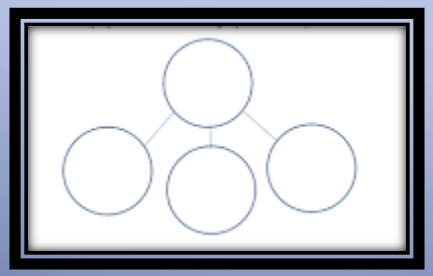

7
Curious Firsties

Composition

A number can be partitioned into more than two numbers

Children need opportunities to explore the different ways that numbers can be partitioned, i.e. into more than two groups. Situations to promote this include increasing the number of pots to put a given amount into, e.g. planting ten seeds into three or more pots.

- role play, e.g. in a toy shop, ten toys need arranging onto the three shelves. How will you organise them?
- having more than two places to sort things into in any given context, e.g. arranging characters in small-world play in different locations



Composition

- *Number bonds – knowing which pairs make a given number*

Children need opportunities to say how many are hidden in a known number of things. For example: 'Five sweets are in a bag, then two come out. How many are left?' The child should respond that there are still three sweets in a bag.

- playing hiding games with a number of objects in a box, under a cloth, in a tent, in a cave, etc.
- utilising classroom routines such as tidy-up time to identify how many are still missing from a pot with a number label.

Common Errors May Include....

- children suggesting that a larger number than the total are hidden.

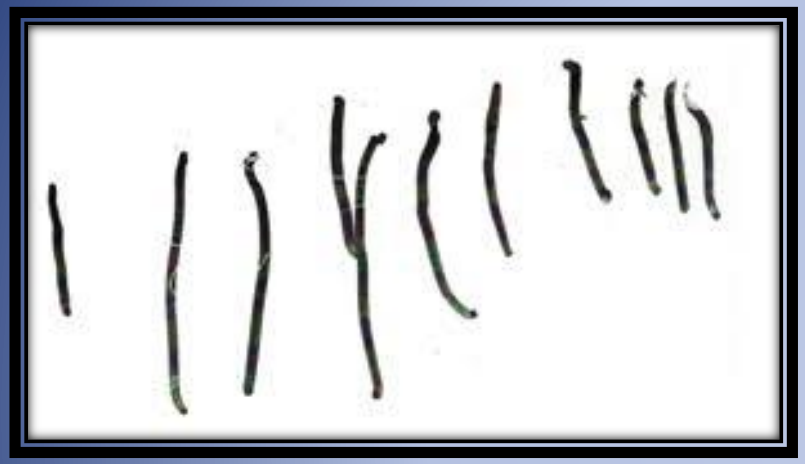
Vocabulary

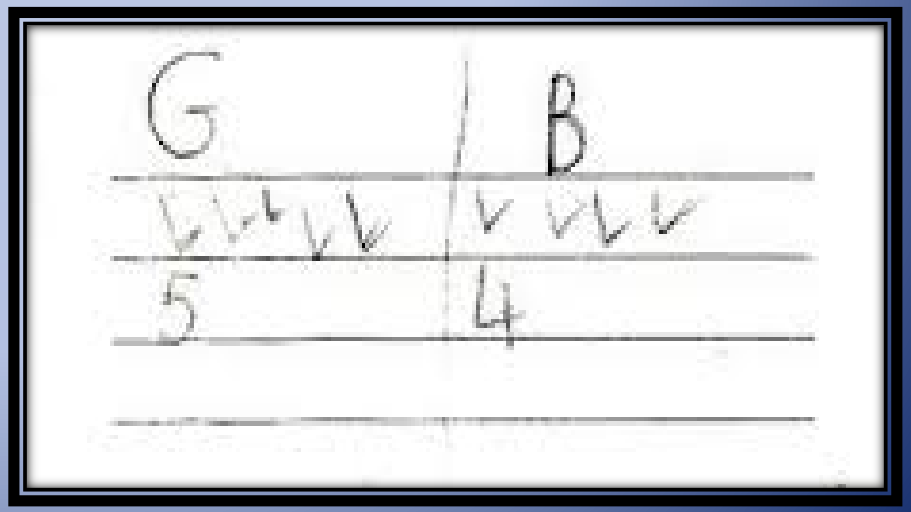
Number	Estimating
zero number one, two, three … to twenty and beyond teens numbers, eleven, twelve … twenty none how many …? count, count (up) to, count on (from, to), count back (from, to) count in ones, twos, fives, tens is the same as more, less odd, even few pattern pair	guess how many …? estimate nearly close to about the same as just over, just under too many, too few enough, not enough

Vocabulary

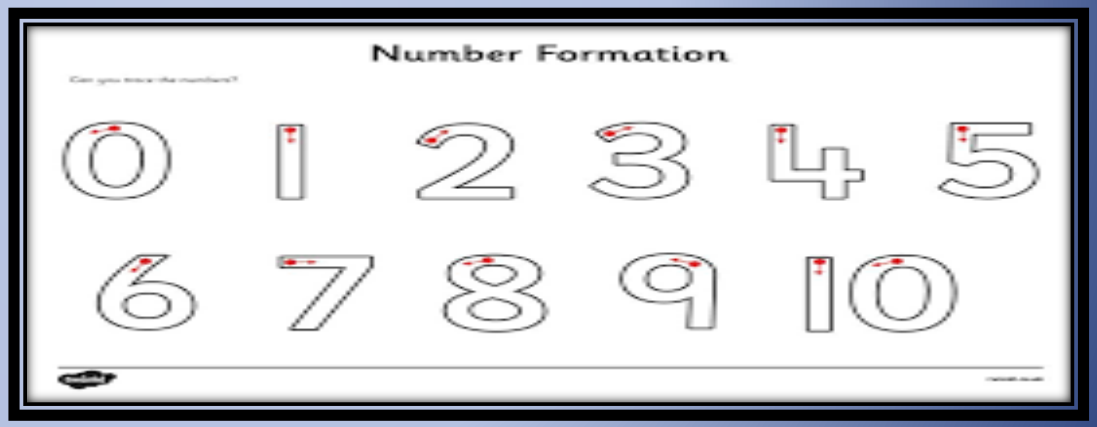
Addition and Subtraction	Place Value
add, more, and make, sum, total altogether double one more, two more … ten more how many more to make …? how many more is … than …? how much more is …? take away how many are left/left over? how many have gone? one less, two less, ten less … how many fewer is … than …? how much less is …?	digit the same number as, as many as more, larger, bigger, greater fewer, smaller, less fewest, smallest, least most, biggest, largest, greatest one more, ten more one less, ten less compare order size first, second, third… twentieth last, last but one before, after next between

Making Marks and Calling Them Numbers





Recording Numbers and Correct Number Formation



Learning Through Play

Observing children's play is the only accurate way for practitioners to assess development across all areas of learning and for them able to gauge the right levels of interaction and support that will enhance and extend the learning experience.

An Enabling Environment

That is why the enabling environment is so important for development and learning. A truly enabling environment provides stimulation and the positive relationships that support children to feel safe enough to explore and extend learning.

Maths Area

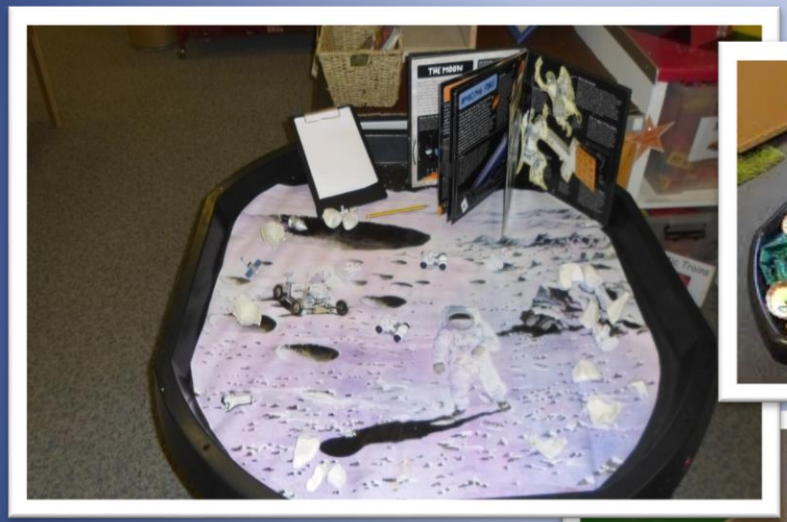
Maths Area

Ensuring opportunities for Mathematics in every area

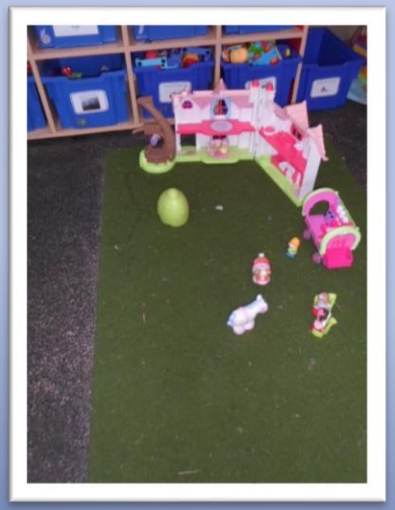
Some children may not 'choose' to go into a maths area, so maths is incorporated in each area wherever possible.

Role Play Area

Small World



Small World

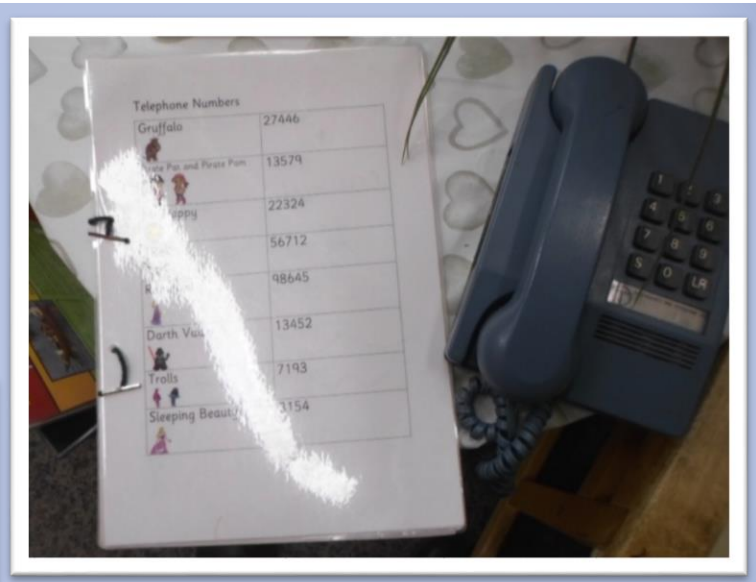


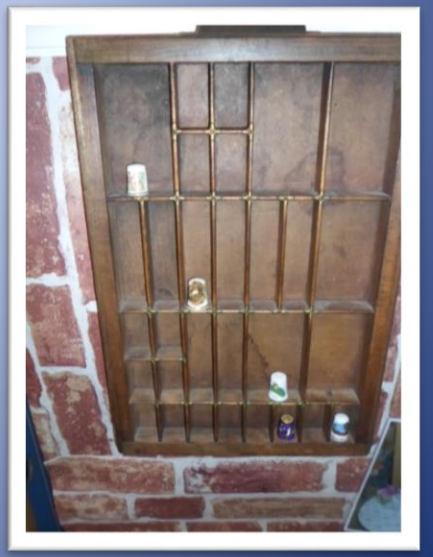
Busy Fingers

John Hampden School Wendover
Loving to Learn

Sand and Water Area

Home Corner


Telephone Numbers
Gruffalo
27446
13579
22324
56712
98645
13452
7193
3154



The Home Corner

Mathematical Opportunities In The Home Corner

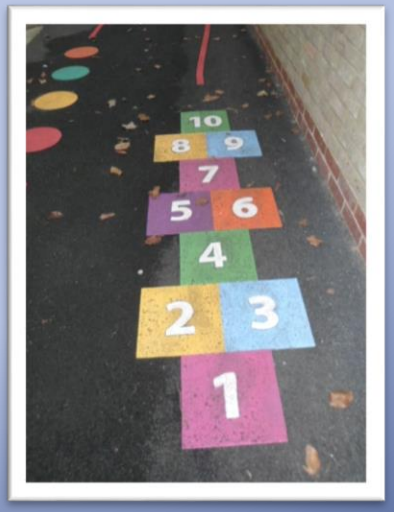
- giving objects from collection, number names in order, drawing to show numbers and amounts, showing which group of toys or plate of food has “more”, using words like “more” and “a lot” to describe amounts of objects, adding a toy to a collection or some food to a plate to have more and taking something away and not having as much, singing counting rhymes to babies
- knowing numbers tell me how many things are altogether – for example 8 sandwiches on a plate, talking about numbers and asking questions, knowing that there are the same number of things, like 2 cakes, one for you and one for me, sharing out in different ways, like putting 10 biscuits out and putting them on 2 plates, then 3 plates and knowing there are still 10 biscuits, making marks and calling them numbers, counting apples, sugar lumps, pets, thimbles.

- Plan a picnic deciding how many sandwiches and bananas needed, recognising numbers of importance for example the number 4 or 5 on a birthday card, counting the number of things on birthday cards, more or fewer potatoes, carrots or courgettes, one more one less or how many altogether, using marks and pictures to show counting, for example on shopping lists, using counting to solve problems, for example putting one cake on each plate.

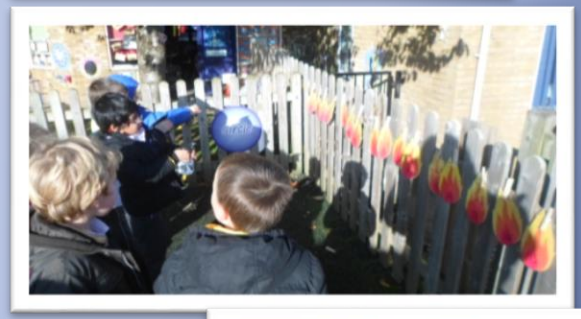
Other Number opportunities:

- Phone – phone numbers
- sorting – pet treats
- Pairs, counting in 2’s - socks, shoes,

Outdoor Maths Opportunities



Outdoor Maths Opportunities



Outdoor Maths Opportunities

Recording in each area either white boards, chalk boards, clipboards

Celebrating Achievements

Celebrating Achievements

Every child has one piece of maths learning displayed each half term, which then is placed in their journal. Children are really proud of their 'stars'.

Celebrating How We Learn

Every child has one star placed on the Values Board, which then is placed in their Journal. Children are really proud of their 'stars'. This could be for working independently, collaborating, persevering or reflecting in many things including Maths.

Support From Parents