Number Sense and Fluency in KS1

Number Sense and Fluency in KS1

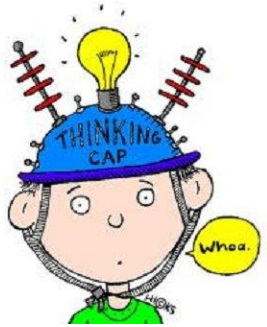
Welcome ☺

A few reminders before we begin:

- Please can we remind you to turn off your mobile phone;
- We would request that you wear a face mask if you are able to do so;
- During the classroom session we would ask that you be respectful of the learning expectations that we ask the children to follow;
- Please remain at the back of the classroom unless the teachers ask you to join the children – there will be an opportunity for you to work alongside your child after the teacher input.

Aims of this morning:

- To give you an overview why we teach number sense and fluency in and how we do it;
- To discuss ways you can support your children at home, including games you can play;
- To see key elements of our teaching and learning in action.



Why, what and how!

Maths at Thorndown

- Deep conceptual understanding
- Fluency and number sense
- A love of maths and can-do attitude

What is Mastery of Mathematics?

- ***A mastery approach**: a set of principles and beliefs. This includes a belief that all pupils are capable of understanding and doing mathematics, given sufficient time. Pupils are neither 'born with the maths gene' nor 'just no good at maths'. **With good teaching, appropriate resources, effort and a 'can do' attitude all children can achieve in and enjoy mathematics**.*

NCETM
NATIONAL CENTRE FOR EXCELLENCE IN THE TEACHING OF MATHEMATICS

What do we teach in maths?

There are three aims in the National Curriculum

To ensure that all pupils…

1.

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately

3 elements to fluency:

- Accuracy
- Efficiency
- Flexibility

What do we teach in maths?

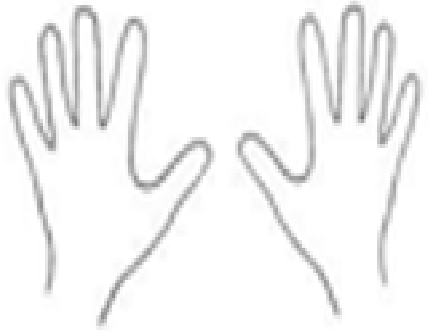
2.

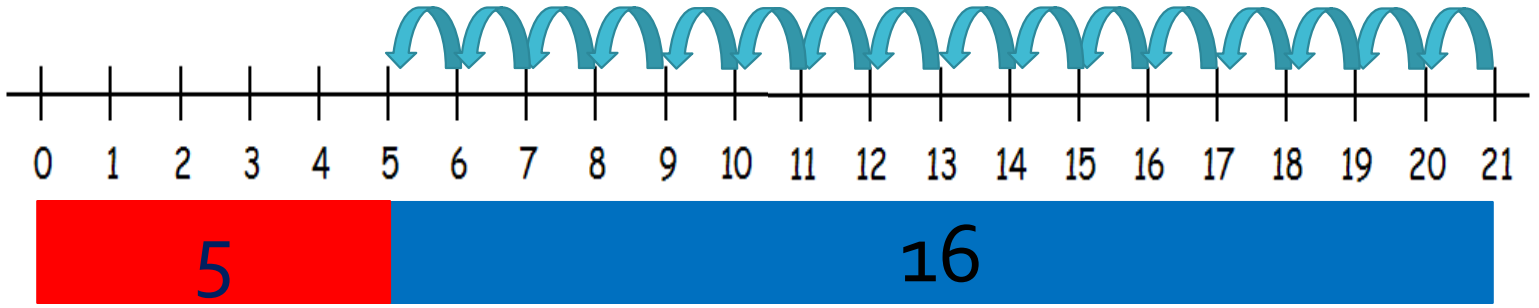
- **reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language

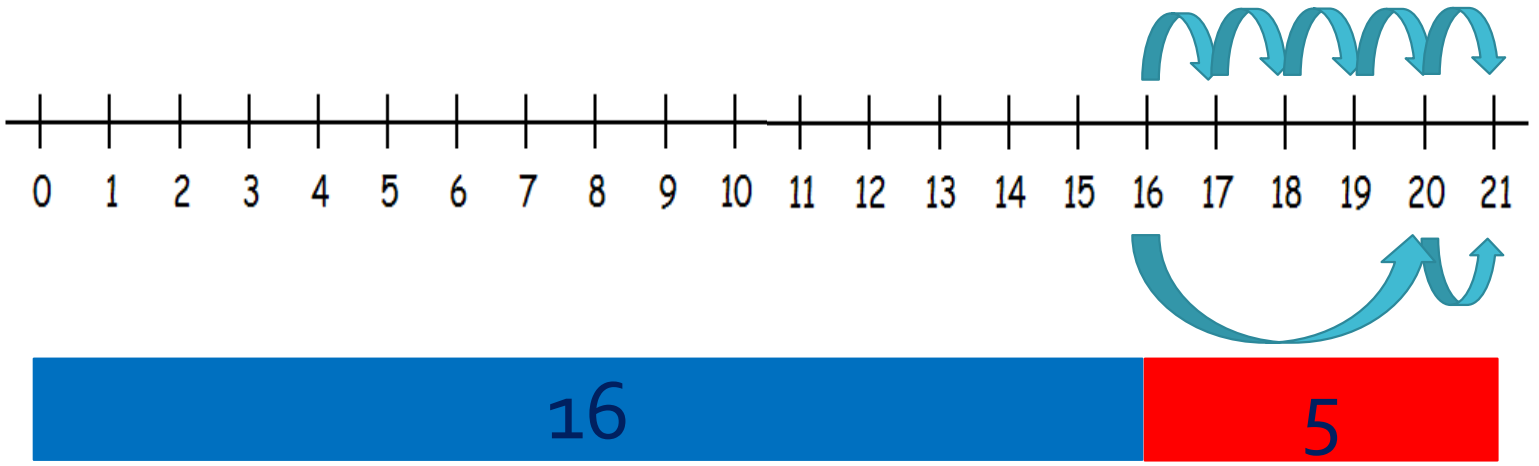
3.

- can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

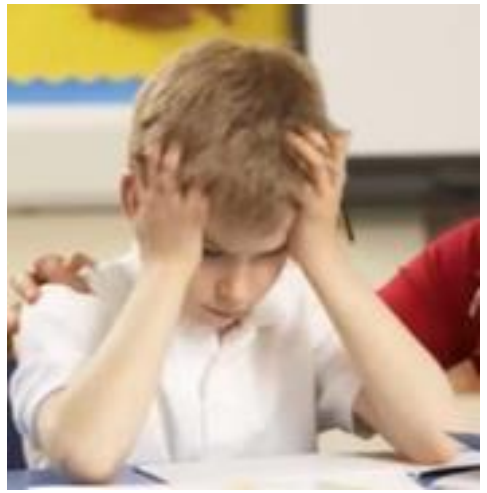
21 - 16




0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
5
16


0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
16
5

Why do the children need to move on from counting?



Over reliance on COUNTING

→Works well with simple tasks, but children often struggle to apply to other contexts

→ Associated with low attainment

→Children don't have alternative strategies

→Inhibits flexible thinking and the development of problem solving strategies

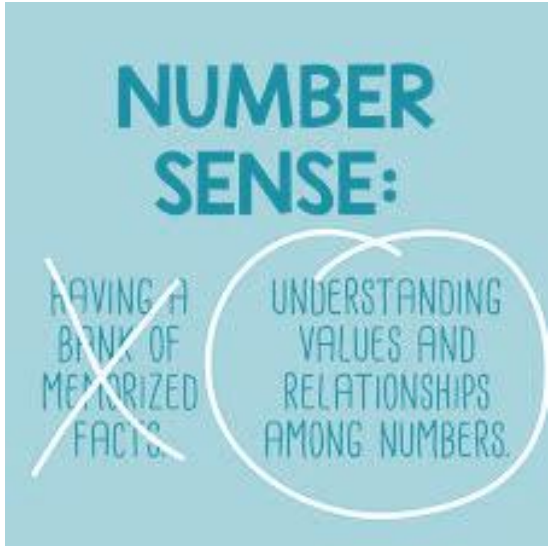
Research from Tall and Gray

What is number sense?

Number sense is having the level of understanding of numbers that allows us to make connections between the facts we know and the problems we are looking to solve.

Research has found 3 key areas that help to predict children's future maths ability:

- Having good sense of the size of numbers
- Being able to subitise
- Being able to invent strategies



Number Magnitude

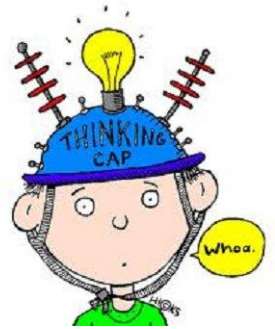
'Immature number line representation is linked to both lower mathematical performance, but also with hindering learning of new mathematics.'

(Booth & Siegler , 2008)

Which is larger: 3 or 6?

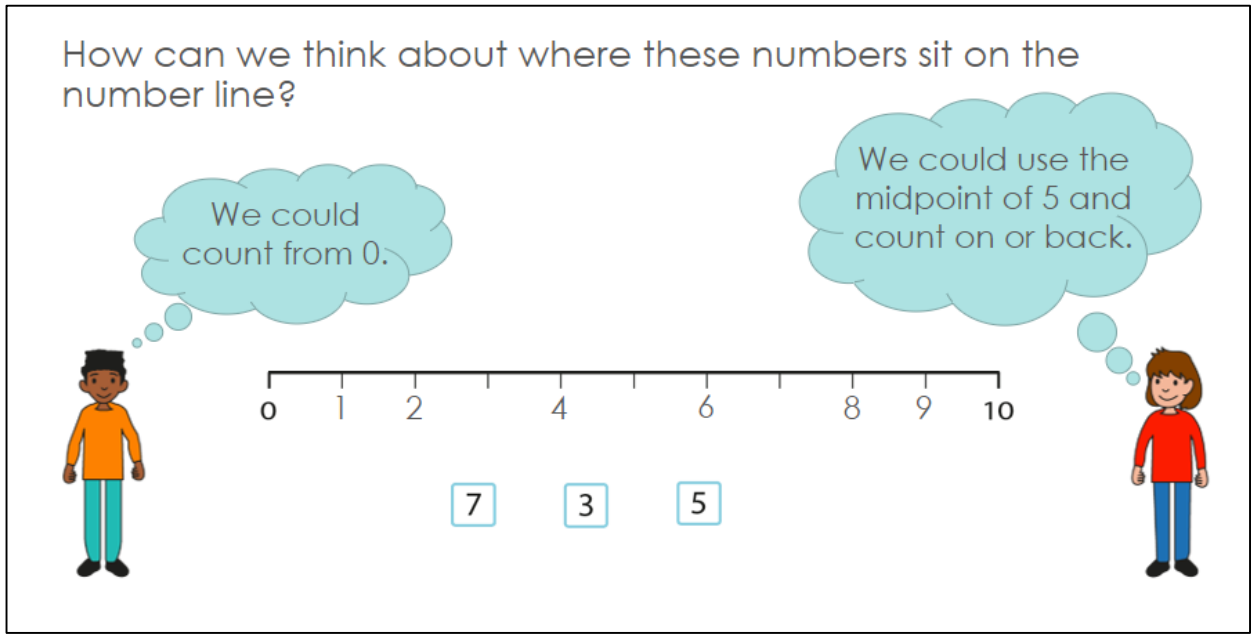
How close can you get to 1?

Which is larger: $\frac{1}{3}$ or $\frac{1}{6}$?



Number Magnitude

It is important to develop linear estimation.



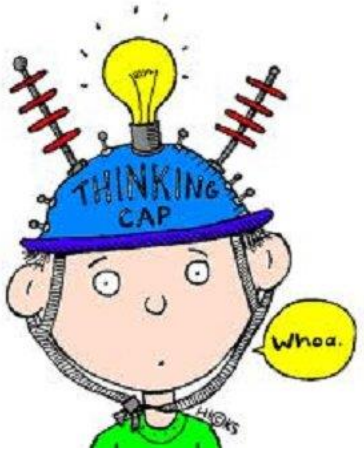
Activities like this help to develop strategies for estimating and children's sense of the relative size of numbers.

It is essential that children explain their reasoning.

Subitising

Let's play…

Bunny Ears



Subitising

Subitising – from the Latin ‘suddenly’

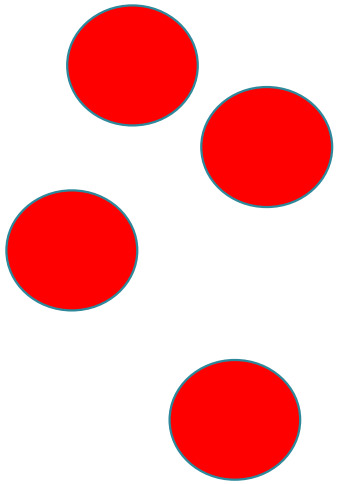
There are two types of subitising.

Subitising

Get ready!

How many spots can you see?

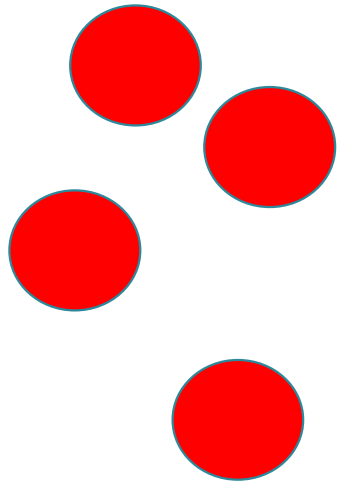
Subitising



Subitising

Perceptual Subitising

- Being able to ‘just see’ how many are in a group, without counting

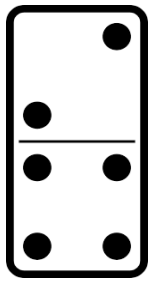


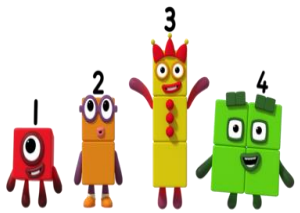
Perceptual Subitising

Subitising

- Finger patterns

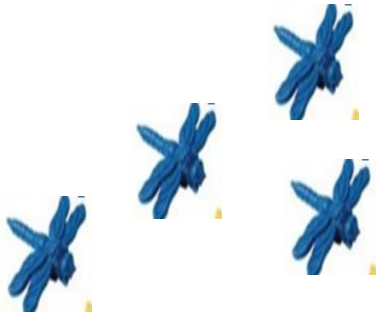
- Familiar and structured dot patterns (1 → 6)

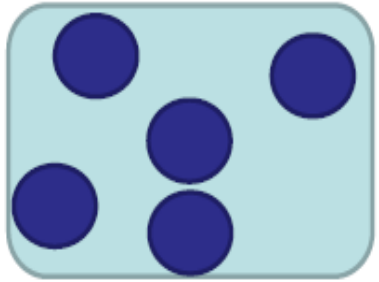




- Unstructured arrangements

Secure 1 to 3 first, moving to 4 or 5 by the end of Reception



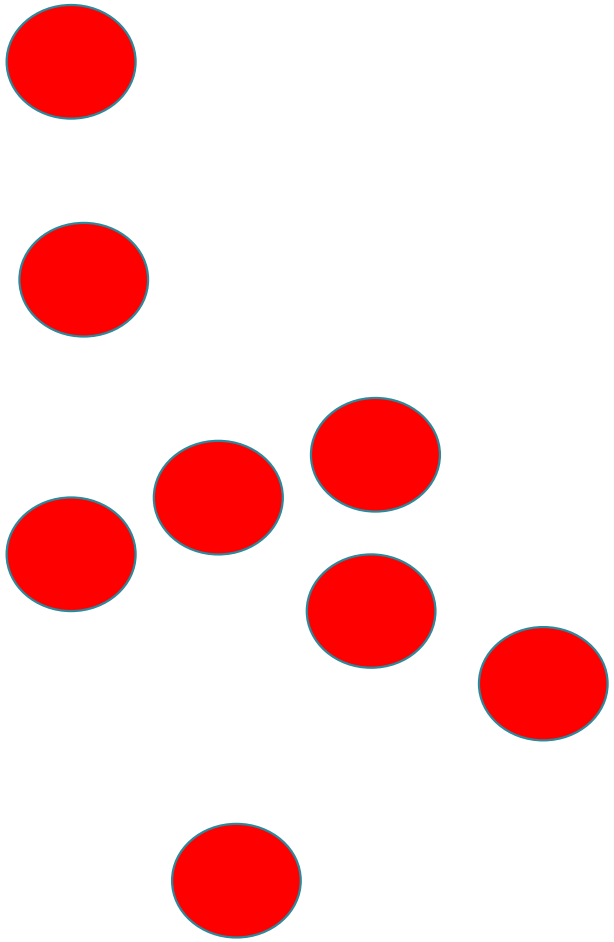


Subitising

Get ready for
the next one!

How many spots can you see this time?

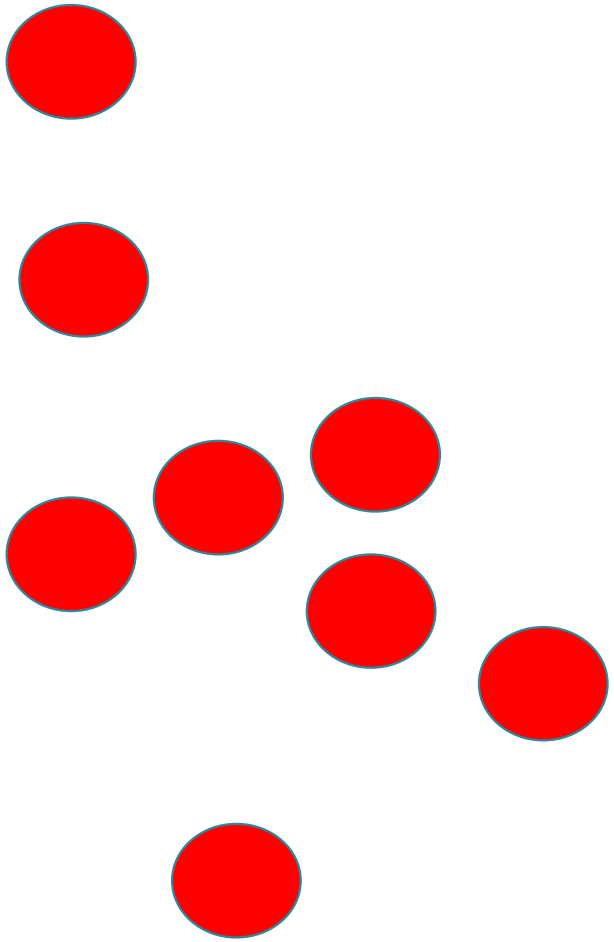
Subitising



Subitising

How many spots did you see this time?

Subitising



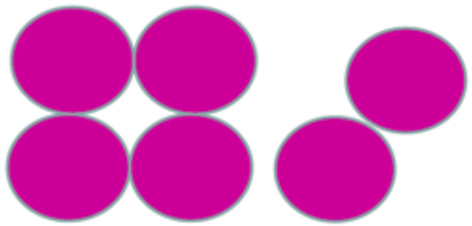
Subitising and composition

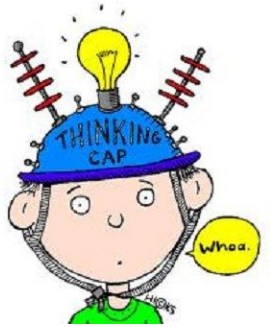
Conceptual Subitising

Being able to see numbers within numbers (eg 6 is made of 4 and 2). This helps to develop efficient calculating skills.

This can be described as 'numbers hidden within numbers'.

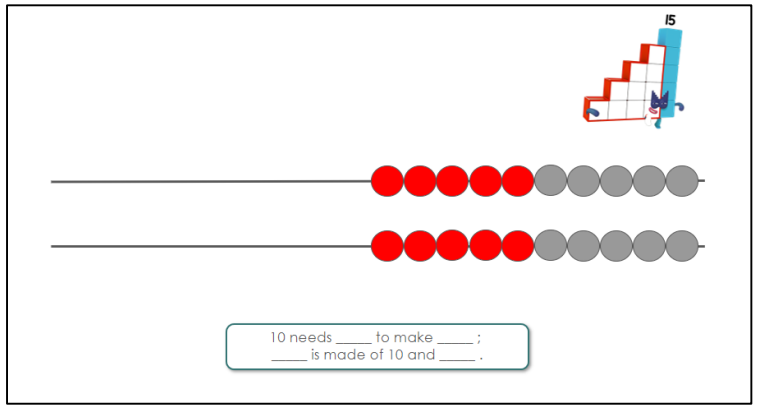
Automatically recall

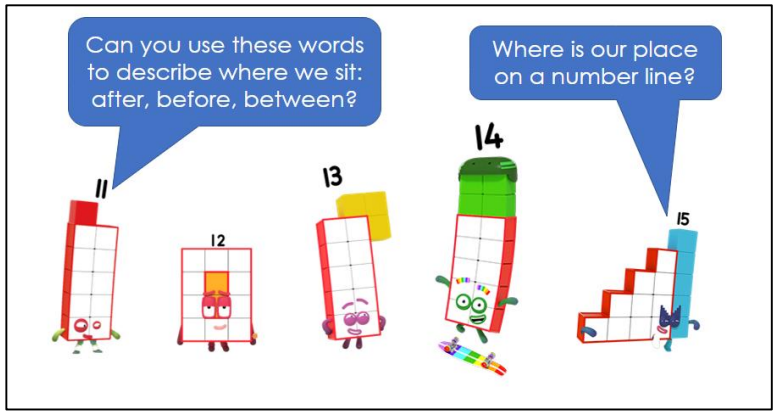




How do we support the children to develop their number fluency?

The children take part in taught daily sessions using the Mastering Number Programme four times each week.





Can you use what you know to fill in the missing symbol?

=	<	>

10 + 4 < 15

10 + 4 > 13

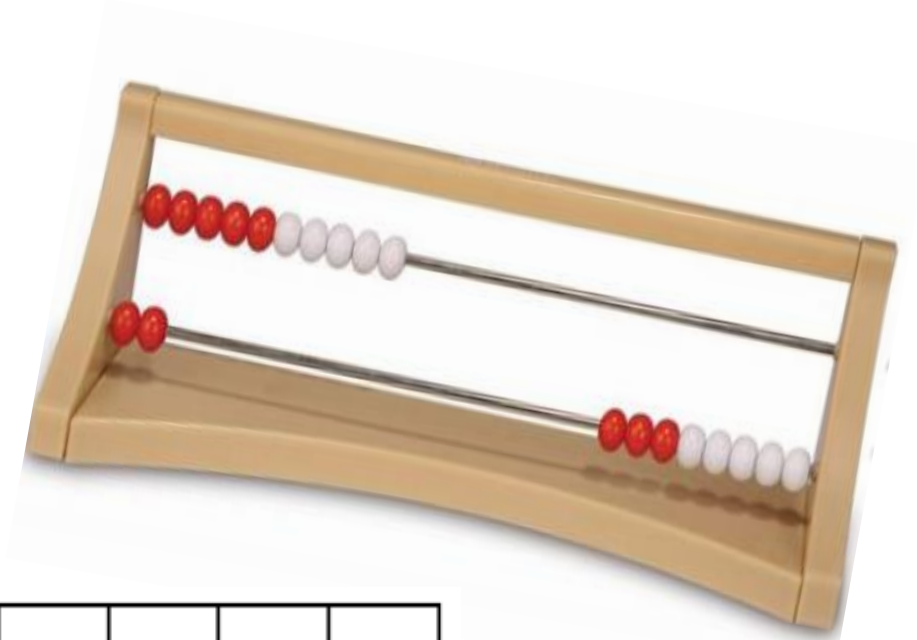
10 + 4 = 14

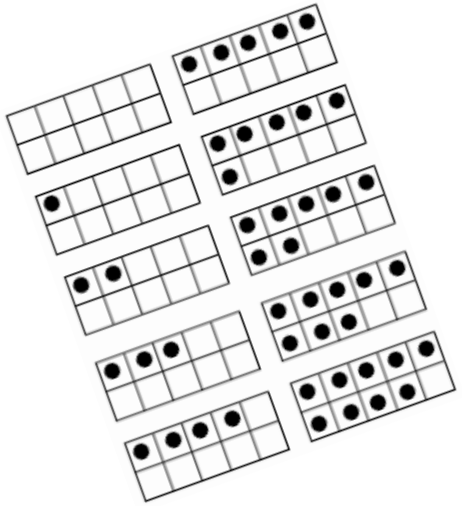
These sessions provide regular opportunity to revisit and review prior learning while supporting children to understand how they can be used to make links with new learning opportunities.

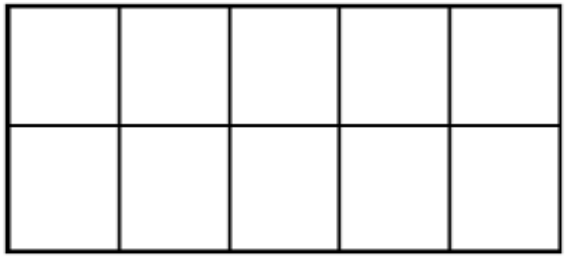
NCETM
NATIONAL CENTRE FOR EXCELLENCE IN THE TEACHING OF MATHEMATICS

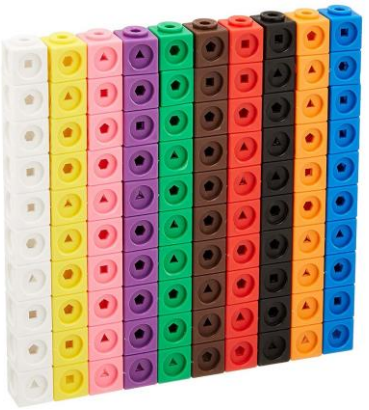
What do the resources look like?

A range of models and images alongside a variety of physical resources are used to support the children to understand the concepts being taught.









The use of games to support depth of understanding?

In addition to the taught number fluency sessions, the children also have regular opportunities to play games which enable them to use their fluency skills for purpose.

In Year 1, this can form part of their Busy Learning time.

In Year 2, we make time during our number fluency sessions to play games which link to the learning from that day or to revisit previous learning.

Thorndown Primary School
Number Sense Games and Activities.

Bunny Ears
Equipment needed- Two hands!
This game can be played in a variety of ways. The first way is simply to establish children's understanding of how numbers can be represented on their fingers. Children are told a number and then represent this on their fingers (without looking at them and whilst holding them behind their ears- representing a bunny!) It's good to consider how many different ways the child can represent one number.
The second variation is to make pairs totalling a certain number. Children are shown a number (in the form of bunny ears) by an adult and have to make the corresponding number on their fingers in order to total the target number. Eg. We're making 10, I show three, child shows seven. Children should be encouraged not to count their fingers.

Mind Reading Cards.
Equipment needed- Tens frame cards/playing cards.
Two children choose a playing card or a tens frame card from pack. Children put the playing cards on their foreheads so that they cannot see their own card.
Surrounding children/adults tell the children the sum of the cards.
Children work through possibilities/use information to work out what their number is.
"If the total is 8 and I can see the other person's number is 5, then my number must be…"

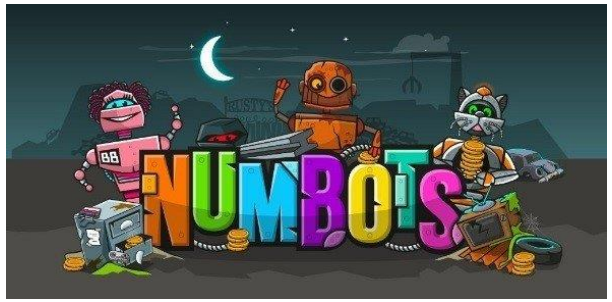
Tens Go Fish
Equipment needed- Tens frame cards/playing cards.
Children to have five tens frames cards with various numbers on them. The rest of the cards are to be placed in the middle (face down.)
The object of the game is to get rid of all of your cards.
When it is your turn, if you have two cards which make 10 you can place them into the middle.
If you do not have two cards that make 10 you have to take a card from the middle or ask your opponent if they have the compliment to a card which you already have in order to make a pair to 10. If your opponent has the card they must give it to you, if they don't they can tell you to 'go fish' and you must take two cards from the middle! The first person to have no cards is the winner.
This game can be extended to be 12, 15, 20 go fish!

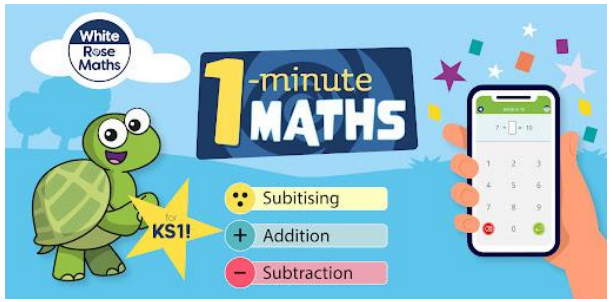
How can you support your child at home?

Involve your child in everyday maths.

Discuss the size of numbers with your child and encourage them to have a go at estimating numbers.

Play games – these can be games recommended by school or play board games and card games that you have at home.





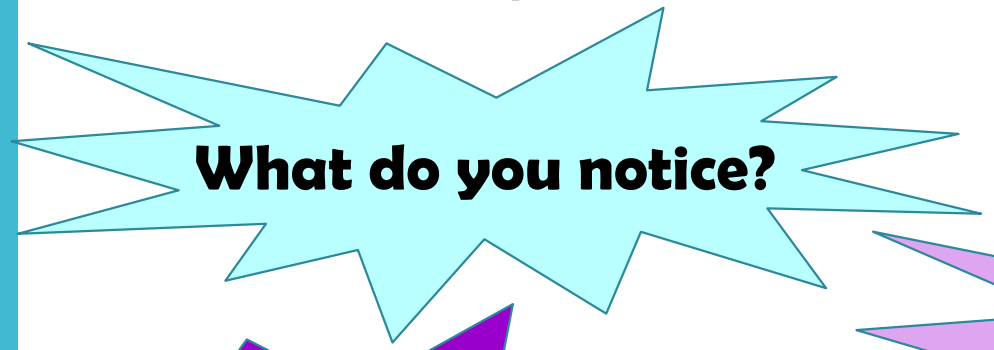
‘PLEASE, PLEASE… NEVER say that you are bad at maths … not anywhere within a 100-mile radius of any child you ever want to influence.’

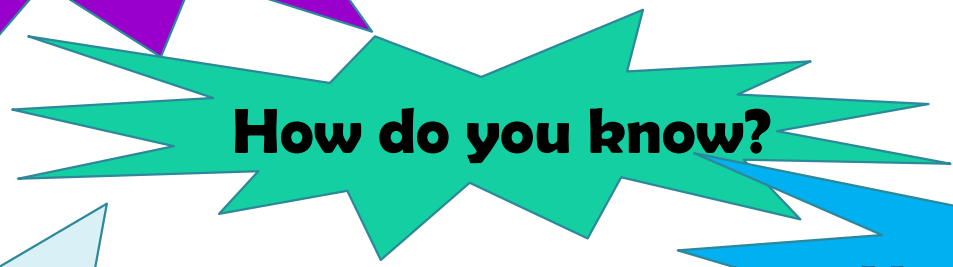
Naomi Sani

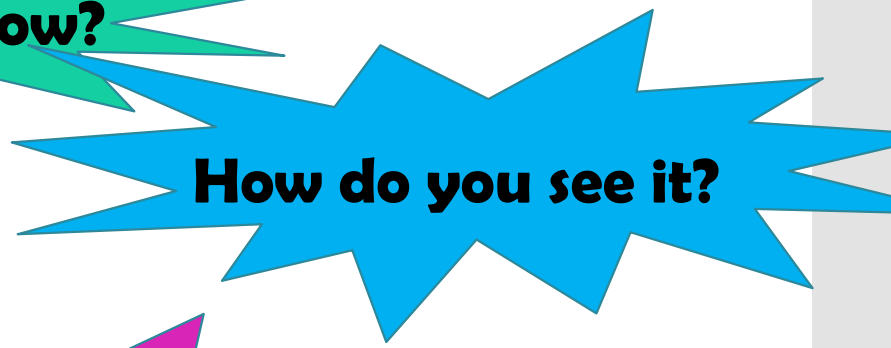
‘How To Do Maths So Your Child Can Too’

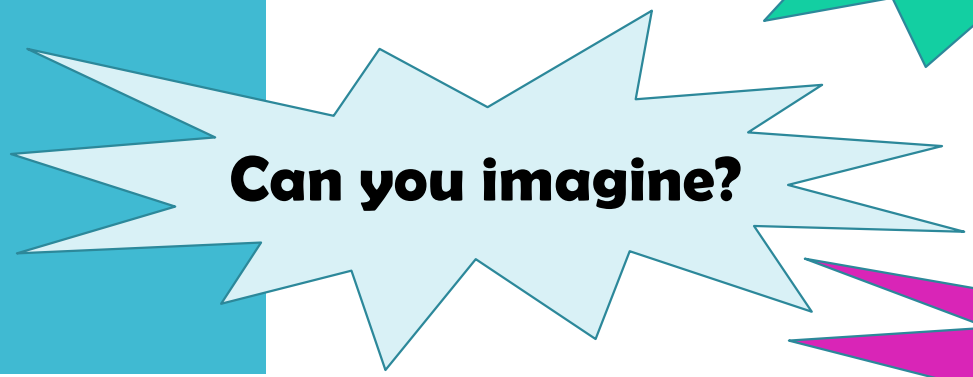
Fab questions to ask your child!

How can you support your child at home?









In the classroom… …what to look for

- Subitising –
  - fast eyes,
  - "Don't count, say the amount"
- Counting - including from a larger set
- Composition
  - how number are made
  - numbers within numbers
- Visualising – How do you see it?
- Spatial awareness/ reasoning
- Gesturing
- Mathematical talk
  - Stem sentences
  - Precise vocabulary
- Questioning