



# Primary SEND Planning Tools

## HIAS Mathematics Team

Professional Development  
Accredited Lead



National Centre  
for Excellence in the  
Teaching of Mathematics

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# Session 1

- Principles and rationale underpinning The English and Mathematics Planning Tool for pupils with SEND –for senior leaders, SENCOs, maths managers and class teachers
- Statutory expectations, guidance reports and resources supporting high quality provision and aspirations
- Using the tools to support planning and teaching: structure and organisation
- Pedagogy supporting high quality provision and aspirations
- Domains focus: number and place value, addition and subtraction including outcomes from pre course task
- Action Planning
- Gap Task



# Special educational needs and disabilities code of practice: 0-25 years

## Special educational needs and disability code of practice: 0 to 25 years

Statutory guidance for organisations which work with and support children and young people who have special educational needs or disabilities

January 2015

‘Our vision for children with special educational needs and disabilities is the same as for all children and young people – that they achieve well in their early years, at school and in college, and lead happy and fulfilled lives.

This new Special Educational Needs and Disability Code of Practice will play a vital role in underpinning the major reform programme.’

‘... **Their special educational needs and disabilities will be picked up at the earliest point with support routinely put in place quickly, and their parents will know what services they can reasonably expect to be provided. Children and young people and their parents or carers will be fully involved in decisions about their support and what they want to achieve. Importantly, the aspirations for children and young people will be raised through an increased focus on life outcomes, including employment and greater independence.** ‘

# Definition of SEND

A child or young person has SEN if they have a learning difficulty which calls for special educational provision to be made for him or her. SEN provision is that which is **different from or additional to that normally available** to pupils or students of the same age.

The Children & Families Act 2014

**‘Special educational provision is underpinned by high –quality teaching and is compromised by anything less.’**

1.24

Code of Practice, January 2015

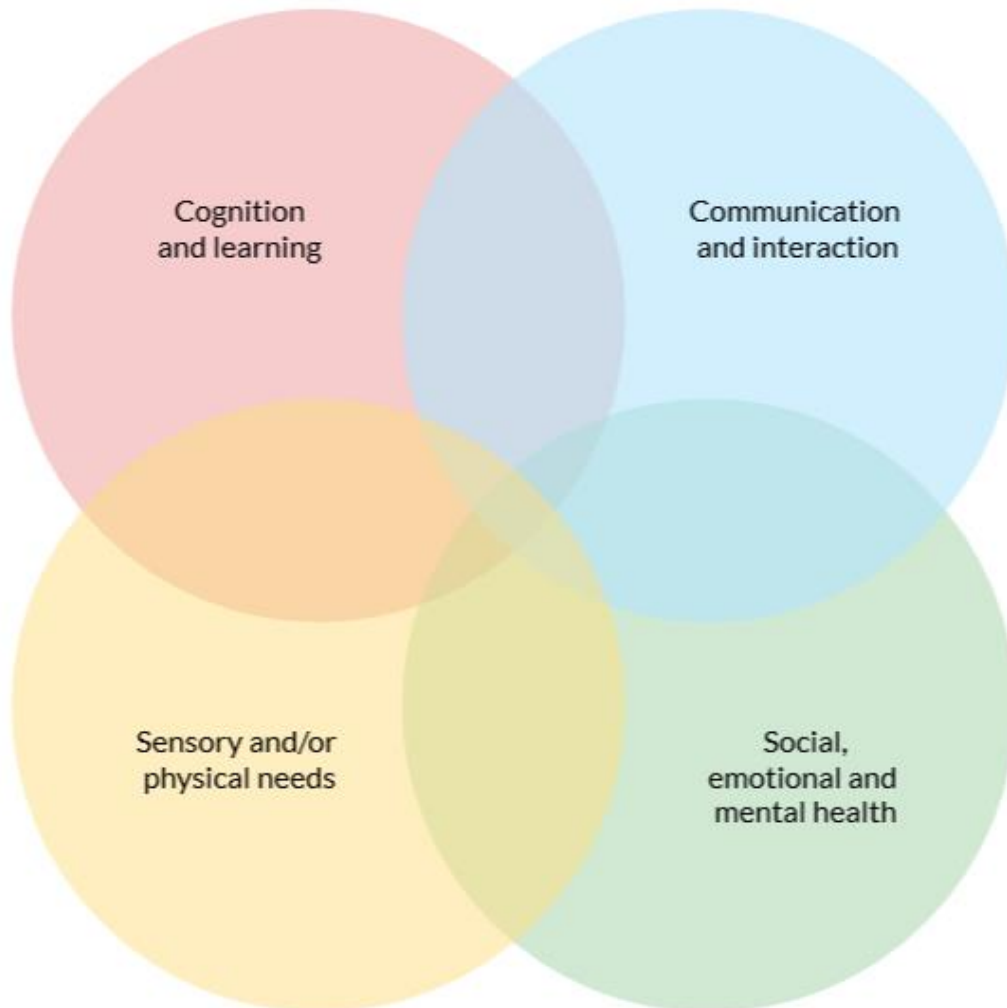


# Principles from The Rochford Review (2016)

- Every pupil should be able to demonstrate his or her attainment and progress.
- Parents and carers should receive meaningful information about the achievement and progress their child makes and should be involved appropriately in assessment processes.
- Equality is not always about inclusion. Sometimes equality is about altering the approach according to the needs of the pupils.
- Curriculum should drive assessment and not the other way round.
- Key milestones should be clear and unambiguous.
- It should also be possible to assess the application of knowledge, understanding and skills in a range of different contexts.
- The language used to describe the achievements and progress of these pupils should always be positive, inclusive and should be jargon free.

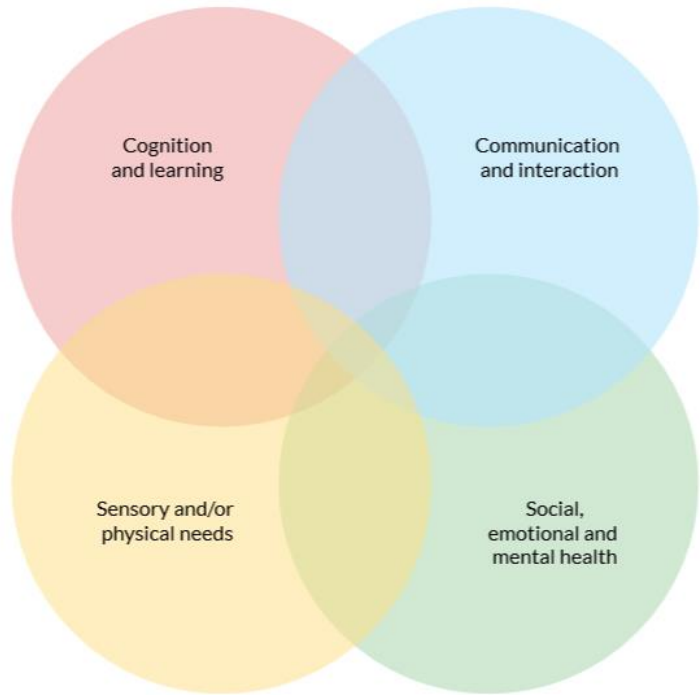


# Four broad areas of need



- ‘...individual children often have needs that cut across all these areas and their needs may change over time. For instance speech, language and communication needs can also be a feature of a number of other areas of SEN, and children with an Autism Spectrum Disorder may have needs across all areas.’
- The special educational provision made for a child should always be **based on an understanding of their particular strengths and needs and should seek to address them all**, using well-evidenced interventions targeted at areas of difficulty and, where necessary, specialist equipment or software.
- This will help to **overcome barriers to learning and participation**. Support should be family centred and should consider the individual family’s needs and the best ways to support them.

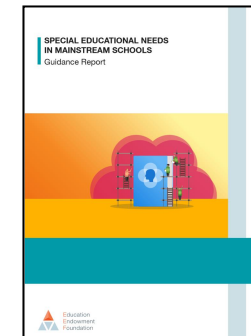




This model of SEND shifts our focus from a condition or diagnosis that a pupil might have to their individual learning needs. The key question is not, ‘What is most effective for pupils with dyslexia?’ The key question becomes:

**‘What does this individual pupil need in order to thrive?’**

From EEF: SEND In Mainstream Guidance report



***How is a need for support in communication and interaction supported in maths lessons?***

- ***Speech and vocabulary development to support reasoning in maths***
- ***Reading and comprehending text is a critical part of problem solving***

In a maths lesson, what might be the implications for SEND support in

- cognition and learning eg reading and writing
- communication and interaction
- physical or sensory needs
- social and emotional mental health

What strategies are used in English lessons? How are the same strategies used in maths lessons?





# SEN Support Guidance for Schools



## Section Five: The Broad Areas of Need

### 5.1 Summary

This section offers the definitions of the broad areas of need and seeks to outline some of the common characteristics that may be exhibited when a CYP is experiencing difficulties in any of the key areas of need. Schools must remember that sometimes a CYP can be experiencing difficulties in more than one area and/or that one area can have a detrimental impact on another, sometimes short-term, especially if there is an unmet need. For example, if a CYP has an on-going unmet need in the area of cognition and learning, that may result in frustration, low self-esteem and/or anger, which could in turn result in challenging behaviour, as an outcome of unmet learning needs.

Exhibiting certain characteristics does not necessarily mean the CYP is in need of special educational provision or that this provision is required long-term. The characteristics described below are to assist in raising the questions for identification, for determining whether further assessment is needed and where the focus of that assessment might be initially.

Every CYP will have a unique set of strengths and needs, and these will change over time and between contexts. The areas and characteristics below are helpful in understanding and identifying needs but should not define or limit our understanding of a CYP.



## Section Six: The Main Categories of Need: Strategies at SEN Support Level

### 6.1 Summary

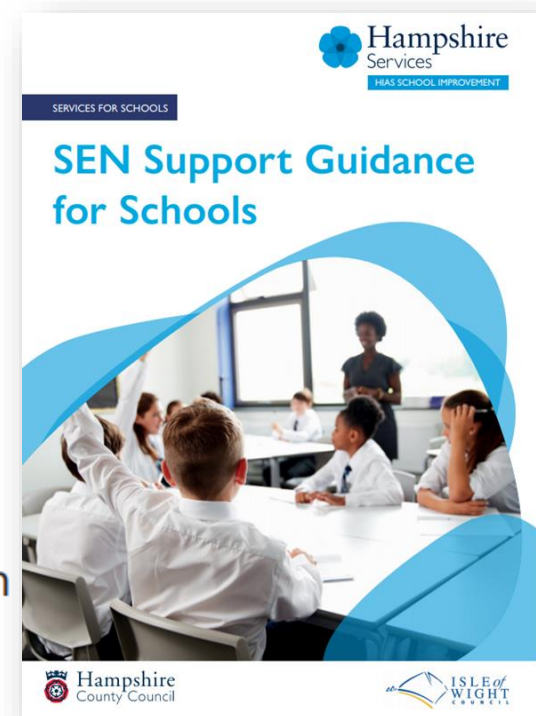
This section identifies some of the key strategies to meet the needs of CYP requiring SEN Support within the four main categories of need. Some of the strategies also feature within the universal offer of high-quality teaching but feature again for SEN Support because they are known to be particularly effective for certain categories of need.

## 2.4 Labels and language - a word of caution

(CYP – Children and Young People)

**Having SEND denotes a difference and inclusive schools with strong leadership embrace difference. Inclusive schools are positive and ambitious in their aspirations for every CYP.**

As with many labels, the term 'SEND' can carry the risk of negative stereotyping and suggest a 'deficit'. It is vitally important that SEND is seen as a difference in need as opposed to a shortcoming or a weakness. There is a danger of lowering aspiration and expectation for those with SEND, which must be proactively averted through the leadership of a strongly inclusive culture within every school setting. Everyone working with a CYP who has SEND must demonstrate high aspirations for and expectations of those CYP, asking the question 'what is it that I/we need to do differently in order to help this CYP access the learning and achieve success?'



# Target Pupils

6.17 Children who are making less than expected progress given their age and individual circumstances.

This can be characterised by **progress** which:

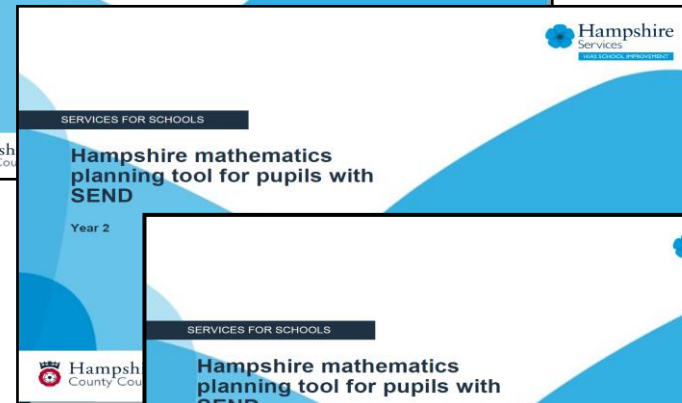
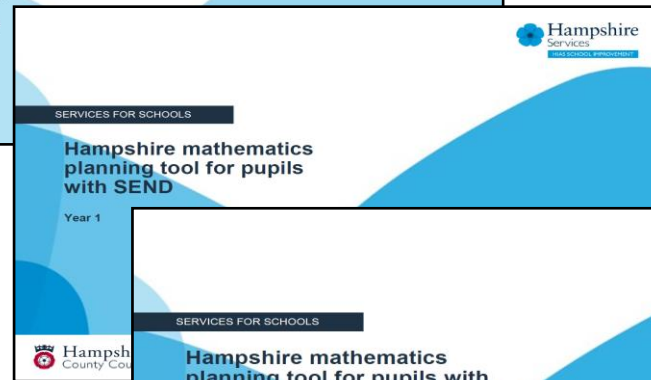
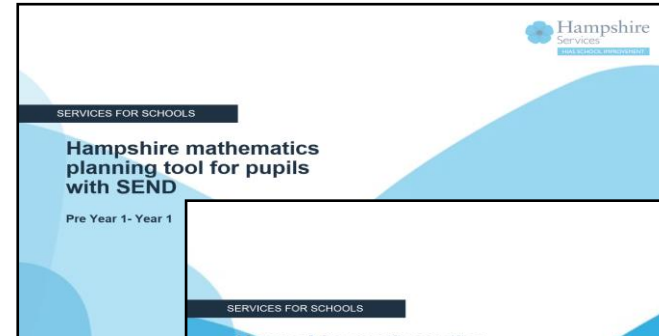
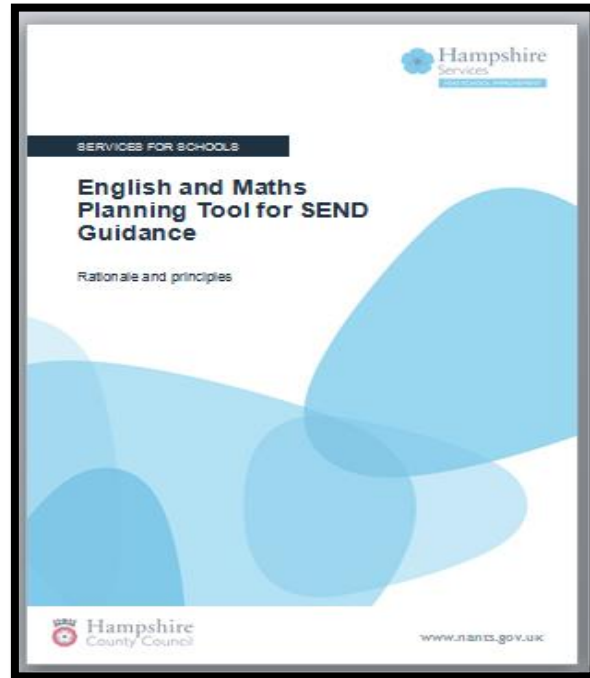
- is significantly slower than that of their peers starting from the same baseline
- fails to match or better the child's previous rate of progress
- fails to close the attainment gap between the child and their peers
- widens the attainment gap'

*(SEND Code of Practice 2015)*

Children who will not have completed the relevant programme of study when they have reached the appropriate chronological age. *(Rochford Review)*



# Hampshire Mathematics planning tools for pupils with SEND



## Primary SEND Tool kits:

- Pre Year 1 to Year 1
- Year 1
- Year 2
- Year 3

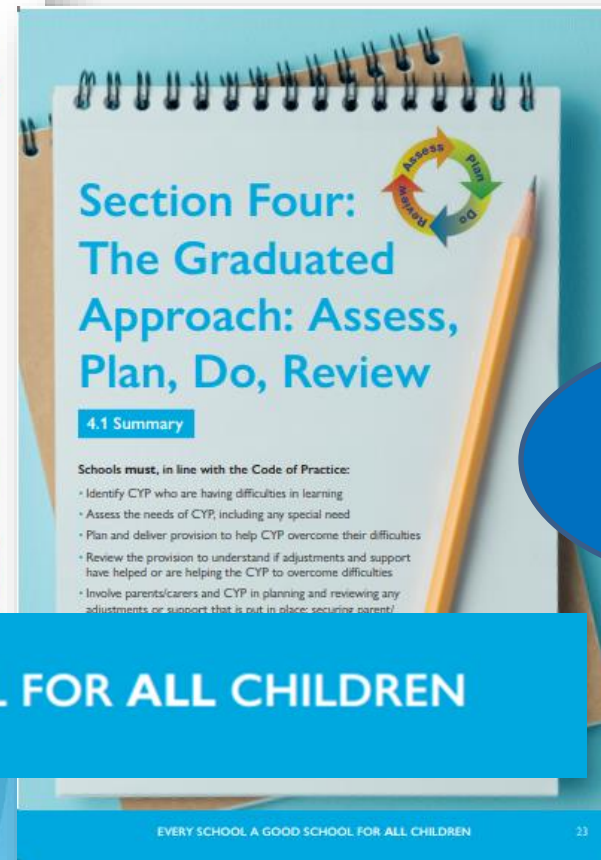
<https://maths.hias.hants.gov.uk>

Course materials

SEND Planning  
Tool Course



# Key supporting documents



**\*\*NEW 2021 \*\***  
**HIAS**

**EVERY SCHOOL A GOOD SCHOOL FOR ALL CHILDREN**

**Available to all  
HANTS and IOW  
schools**



# Key documents: teaching and learning

- EEF: Making best use of Teaching Assistants
- EEF: Improving Mathematics in the Early Years and Key stage 1
- EEF: Special Educational Needs in Mainstream Schools
- EEF: Improving Social and Emotional learning in Primary schools
- NCETM Mastery Task booklets
- DfE June 2020 Mathematics Guidance Non- Statutory.

*inc 'Ready to progress' criteria*



# HIAS maths team resources



- Progression in counting
- Progression in addition and subtraction
- Progression in multiplication and division
- Progression in fractions, decimals and percentages
- Key Number Facts from Year R to Year 3

**Open resources**

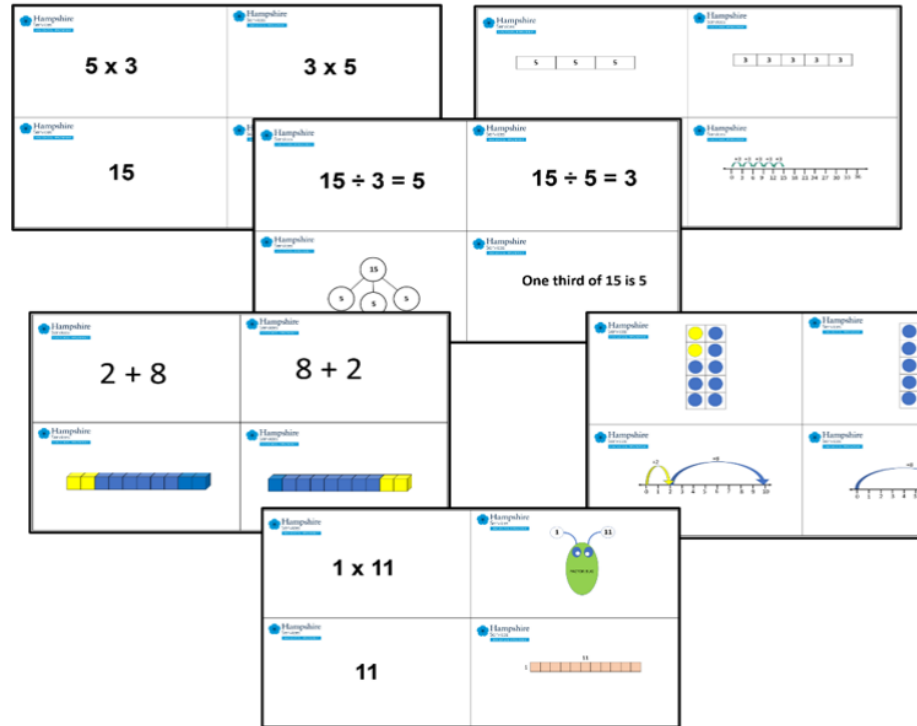
<https://maths.hias.hants.gov.uk>



# Moodle Plus: HIAS maths team resources



Primary Number Facts: Matching cards to support recall and retrieval



- Number bonds to 10
- Number bonds to 20
- Complements to 10
- Complements to 100
- Fractions: halves, quarters, eighths
- Multiplication tables and linked division facts

Moodle+

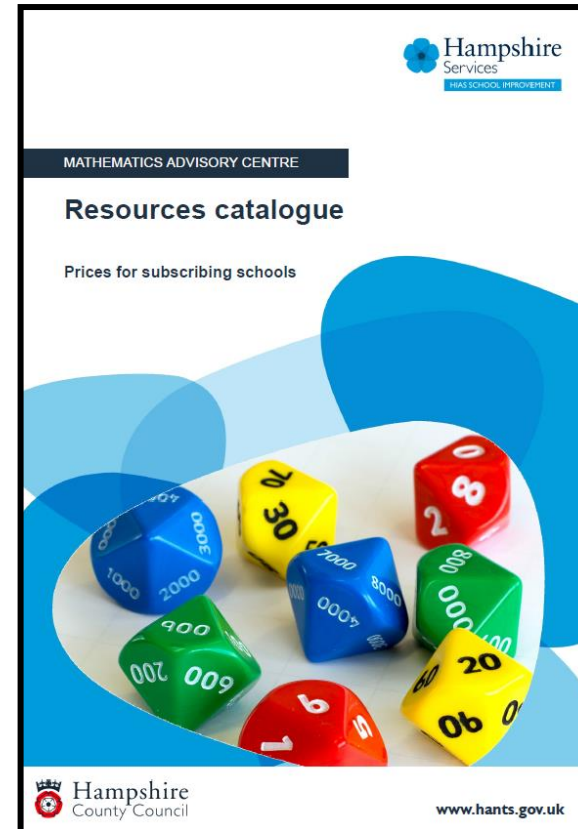
<https://maths.hias.hants.gov.uk>





# Maths Centre Resources: e.g. NPV

- Place value /dienes arrow cards
- Pack of Ten Frames with double sided counters
- Number lines:
  - 0-10; 0-20; 0-100; 0-30;
  - 0-100 ( multiples of tens)
  - Large horizontal Number line
- Bead string
- Numbers and Images ( multiple representation cards)



# Discussion

When do pupils with SEND make the most progress in mathematics?



# Pupils make most progress in Mathematics and English when:

- pupils have the opportunity to become fluent in the fundamentals of the subject through **varied and frequent practice** with increasingly complex tasks over time
- tasks are used to develop **conceptual understanding**
- pupils are supported to recall and apply knowledge increasingly rapidly, accurately and reliably over time
- pupils are expected to **communicate** their **thinking** using appropriate subject specific language and communication (signs, symbols or technology)
- pupils are supported to use discussion in order to learn; they should be able to elaborate and explain clearly their understanding and ideas



# The Hampshire mathematics planning tools

## Supporting the implementation of the Code of Practice



# SEN Support: The graduated Approach



‘...take action to remove barriers to learning and put effective special educational provision in place. This SEN support should take the form of a four-part cycle through which earlier decisions and actions are revisited, refined and revised with a growing understanding of the pupil’s needs and of what supports the pupil in making good progress and securing good outcomes. **This is known as the graduated approach.** It draws on more detailed approaches, more frequent review and more specialist expertise in successive cycles in order to match interventions to the SEN of children and young people’

# The graduated approach (CoP ch 6)

## Assess (review regularly)

- Class teacher, subject teacher and SENCO
- draw teacher's assessment and experience of the pupil,
- previous progress and attainment
- the individual's development in comparison to their peers and national data,
- the views and experience of parents,
- the pupil's own views,
- if relevant, advice from external support services.
- Schools should take seriously any concerns raised by a parent.

## Plan


- All teachers and support staff who work with the pupil should be made aware of their needs, the outcomes sought, the support provided and any teaching strategies or approaches that are required. This should also be recorded on the school's information system.
- The support and intervention provided should be selected to meet the outcomes identified for the pupil, based on reliable evidence of effectiveness, and should be provided by staff with sufficient skills and knowledge

## Do

- The class or subject teacher should remain responsible for working with the child on a daily basis.
- Where the interventions involve group or one-to-one teaching away from the main class or subject teacher, they should still retain responsibility for the pupil. They should work closely with any teaching assistants or specialist staff involved, to plan and assess the impact of support and interventions and how they can be linked to classroom teaching.
- The SENCO should support the class or subject teacher in the further assessment of the child's particular strengths and weaknesses, in problem solving and advising on the effective implementation of support.

# HIAS SEN Support Guidance for schools

## SEN Support Guidance for Schools



## Section Four: The Graduated Approach: Assess, Plan, Do, Review

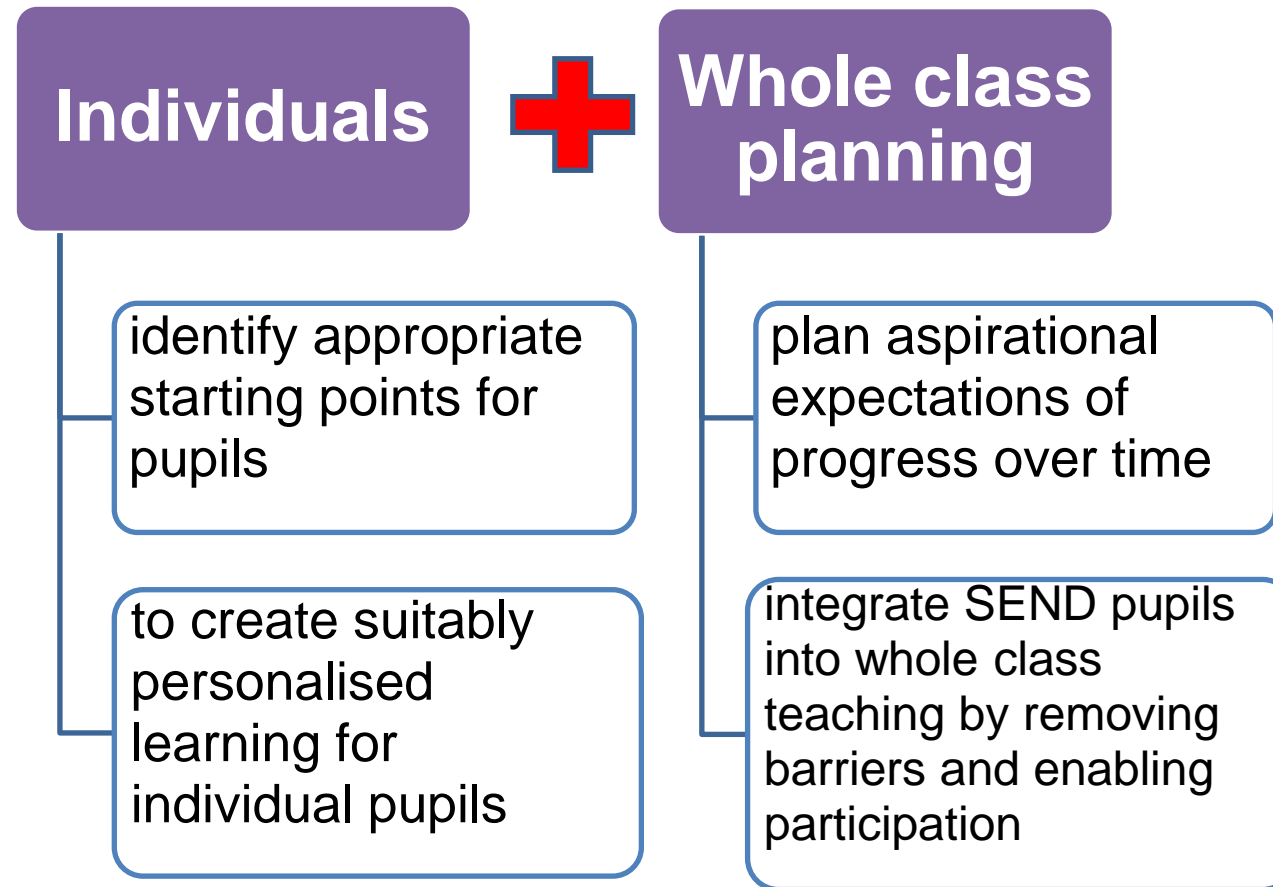
### 4.1 Summary

Schools **must**, in line with the Code of Practice:

- Identify CYP who are having difficulties in learning
- Assess the needs of CYP, including any special need
- Plan and deliver provision to help CYP overcome their difficulties
- Review the provision to understand if adjustments and support have helped or are helping the CYP to overcome difficulties
- Involve parents/carers and CYP in planning and reviewing any adjustments or support that is put in place; securing parent/carer and CYP input throughout the assess/plan/do/review process.

At each level of need within the SEN Pathway – universal, SEN Support, targeted (2 tier), enhanced (2 tier), exceptional – a school needs to apply the assess/plan/do/review model, in collaboration with parents/carers and CYP.

# How do the planning tools support teaching and learning?





# Process for using the Planning Tools

Complete diagnostic assessment activities including day-to-day AfL to identify starting points.

Identify focus domains where the planning tools would support pupil progress.

Narrow down the focus to key strands that will inform planning and teaching. Develop a plan that where ever possible follows the whole class planning.

Identify skills, knowledge and concepts to inform bespoke planning, alongside strategies to teach new learning.

The planning tool can be used as an annotated working document to show areas in which the pupil is making progress



# Layout: Understanding the layout of the planning tool

National  
curriculum  
non-statutory  
guidance

Key concepts for  
the domain

<p><b>Number and Place Value</b></p> <p><b>Year 1: National Curriculum notes and guidance (non-statutory)</b></p> <p>Pupils practise counting (1, 2, 3...), ordering, (eg first, second, third...), and to indicate a quantity, (eg 3 apples, 2 centimetres), including solving simple concrete problems, until they are fluent.</p> <p>Pupils begin to recognise place value in numbers beyond 20 by reading, writing, counting and comparing numbers up to 100, supported by objects and pictorial representations.</p> <p>They practise counting as reciting numbers and counting as enumerating objects, and counting in twos, fives and tens from different multiples to develop their recognition of patterns in the number system, (eg odd and even numbers), including varied and frequent practice through increasingly complex questions.</p> <p>They recognise and create repeating patterns with objects and with shapes.</p>	<p><b>Key concepts</b></p> <ul style="list-style-type: none"><li>• The order of numbers enables comparison between numbers.</li><li>• As you count on the quantity represented by the number becomes larger and becomes smaller as you count back.</li><li>• Numbers greater than 9 are formed by combining more than one digit and numbers between 10 and 20 start with a '1'.</li><li>• The position of a digit in a number indicates its value.</li><li>• The place value system is based on units of 10.</li><li>• Knowing number names /reading teens numbers can be confusing in terms of place value, eg 11, 12, 13, 14.</li></ul>
<p><b>Curriculum strands</b></p> <p>Within the document, the national curriculum programme of study domain number and place value is broken down into smaller curriculum strands to support precise identification of need. The curriculum strands identified are:</p> <ul style="list-style-type: none"><li>• counting</li><li>• comparing numbers</li><li>• identifying, representing and estimating numbers</li><li>• reading and writing numbers</li><li>• understanding place value</li></ul> <p><b>Problem-solving</b></p> <p>Teacher assessment should consider to what extent the pupil is able to apply conceptual understanding of number and place value to solve problems.</p>	



## Understanding the layout of the planning tools

NT

National curriculum non-statutory guidance

**Number and Place Value**

**Year 1: National Curriculum notes and guidance (non-statutory)**

Pupils practise counting (1, 2, 3...), ordering, (eg first, second, third...), and to indicate a quantity, (eg 3 apples, 2 centimetres), including solving simple concrete problems, until they are fluent.

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**Curriculum strands**

Within the document, the national curriculum programme of study domain number and place value is broken down into smaller curriculum strands to support precise identification of need. The curriculum strands identified are:

- counting
- comparing numbers
- identifying, representing and estimating numbers
- reading and writing numbers
- understanding place value

**Problem-solving**

Teacher assessment should consider to what extent solve problems.

Key concepts

- Key concepts**
- The order of numbers enables comparison between numbers.
  - As you count on the quantity represented by the number becomes larger and becomes smaller as you count back.
  - Numbers greater than 9 are formed by combining more than one digit and numbers between 10 and 20 start with a '1'.
  - The position of a digit in a number indicates its value.
  - The place value system is based on units of 10.
  - Knowing number names /reading tens numbers can be confusing in terms of place value, eg 11, 12, 13, 14.

National curriculum statements

Skills, knowledge and concepts		NC expectations – Year 1
Use concrete resources to model and record addition and subtraction calculations (U +/- U) using +/- and = signs.	Uses structured number lines to show addition calculations (U + U).	<ul style="list-style-type: none"> <li>Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs</li> </ul>
Explain and use concrete resources to model commutativity with addition.	Use structured number lines to show subtraction calculations (U - U).	
Explain using concrete resources that subtraction is not commutative, eg 9 - 6, 6 - 9.	Use structured number lines to show addition calculations (TU + U) bridging through 10.	
Use diagrams, eg bar models and concrete resources to explain inverse.	Use structured number lines to show subtraction calculations (TU - U) bridging through 10.	
Identify addition number sentence to solve a simple word problem 3-7 (8-10, 11-20).	Identify subtraction number sentence to solve a simple word problem 3-7 (8-10, 11-20).	
<p><b>Strategies:</b></p> <ul style="list-style-type: none"> <li>support pupils to 'talk out loud' when recording number sentences</li> <li>make explicit links between number sentences and number line recording and or bar model diagrams</li> <li>ensure pupils can relate 'numbers' used to the problem context.</li> </ul>		

Each strand or domain includes '**Skills, knowledge and concepts**'. These are not intended to be linear or that every child will need to be taught each element to achieve the full statement. Some are ideas for teaching, other ideas for assessment to identify barriers to learning for individuals

Each strand or domain includes '**Strategies**' ideas of approaches for teachers to try that may suit a particular pupil more aptly

# Layout: Understanding the layout of the planning tool continued

Each strand or domain includes ‘**skills, knowledge and concepts**’. These are not intended to be linear or that every child will need to be taught each element to achieve the full statement. Some are ideas for teaching, others ideas for assessment to identify barriers to learning for individuals

**National  
curriculum  
statements**

Skills, knowledge and concepts		NC expectations – Year 1
Use recall of number bonds to check solutions (addition) 3-7 (8-10, 11-20).	Group calculations into solutions > < then = to 10.	<ul style="list-style-type: none"> <li>• Add and subtract one-digit and two-digit numbers to 20, including zero.</li> <li>• Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs</li> </ul>
Use recall of number bonds to check solutions (subtraction) 3-7 (8-10, 11-20).	Uses inverse to solve missing box calculations using number bonds 3-7 (8-10, 11-20).	
Use known fact to solve related fact ,eg if $3 + 4 = 7$ then $3 + 5$ must be 8.	Identify calculations that can be worked out easily with counting forwards/ backwards, ie $+1$ , $+2$ , $+/-3$ .	



# Mathematics NC Aims

The national curriculum for mathematics aims to ensure that all pupils:

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



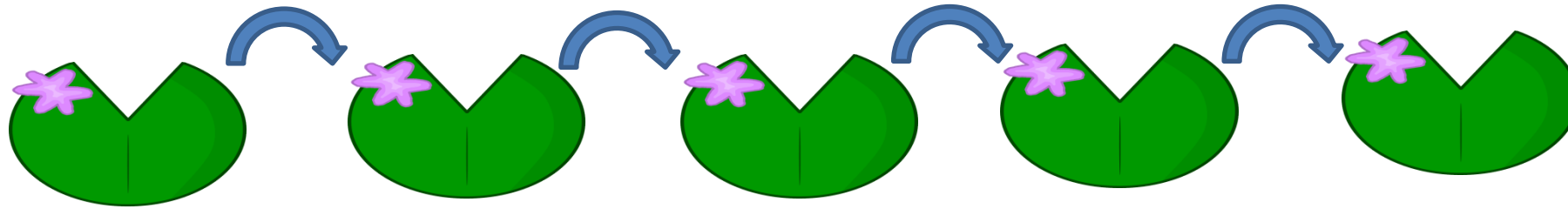
# National Curriculum

## Spoken language

‘The national curriculum for mathematics reflects the importance of spoken language in pupils’ development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their mathematical vocabulary and presenting a mathematical justification, argument or proof. **They must be assisted in making their thinking clear to themselves as well as others and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.**’



# A mastery approach



Be aware of 'lily pad' learning/ surface learning



Aim for less but deeper learning



# Cognitive load and working memory

**Working memory** – the part of our mind that processes what we are currently doing. **It has a very finite capacity. It can hold and process about 4 different processes at a time. If it receives too much it fails.**

(De Jong 2010)



**Long term memory- huge almost infinite-capacity.** We store knowledge of facts and procedures here. The goal is to stock our long – term memories with knowledge in a well organised and easily retrievable way and make recall of key aspects automatic. This frees up the working memory for new information

**Cognitive load** - the cognitive effort (or amount of information processing) required by a person to perform this task. Cognitive load is a process, task or stimulus that limits the available working memory capacity needed to process information. **Cognitive overload is what happens if too many demands are place on working memory at once.** (Sweller 1998)



# Pedagogical approach

- Clarity around learning
- Lessen the cognitive load
- Slow down – teach less but teach it well
- This means that what pupils with SEND do achieve, they achieve more deeply by working through the learning hierarchy, over an appropriate time scale
- They may not learn everything - but what they do learn they learn well can apply with some independence



How much do you know about the pupils with SEND in maths?



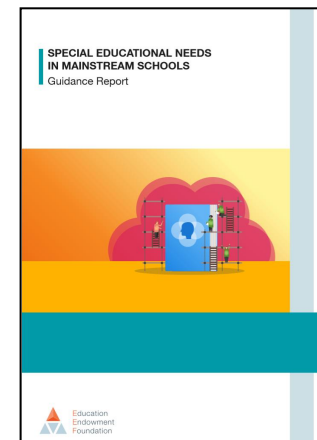
Create a positive and inclusive environment for all pupils without exception

Build an ongoing holistic understanding of your pupils and their needs

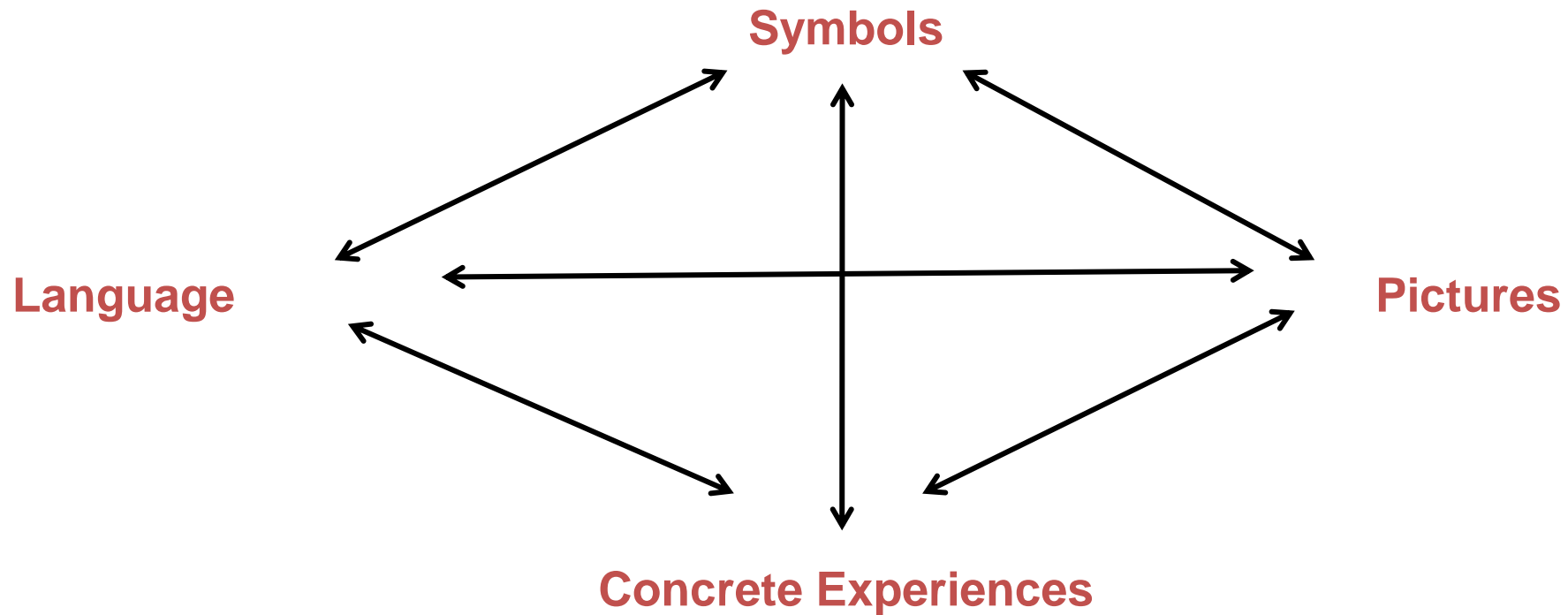
Complement high quality teaching with carefully selected one to one and small group intervention

Work effectively with teaching assistants

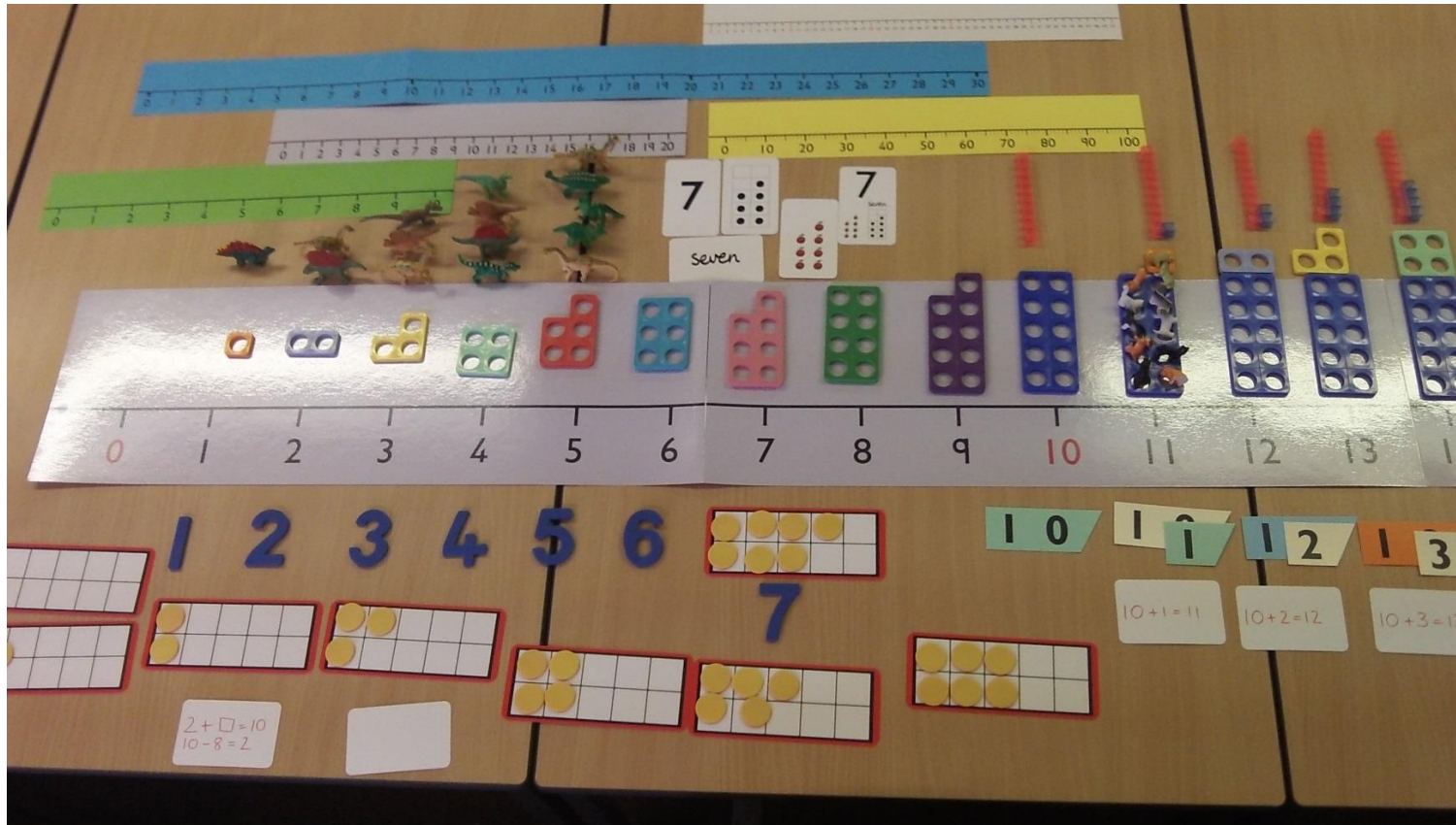
Ensure all pupils have access to high quality teaching



# Children need to make connections...



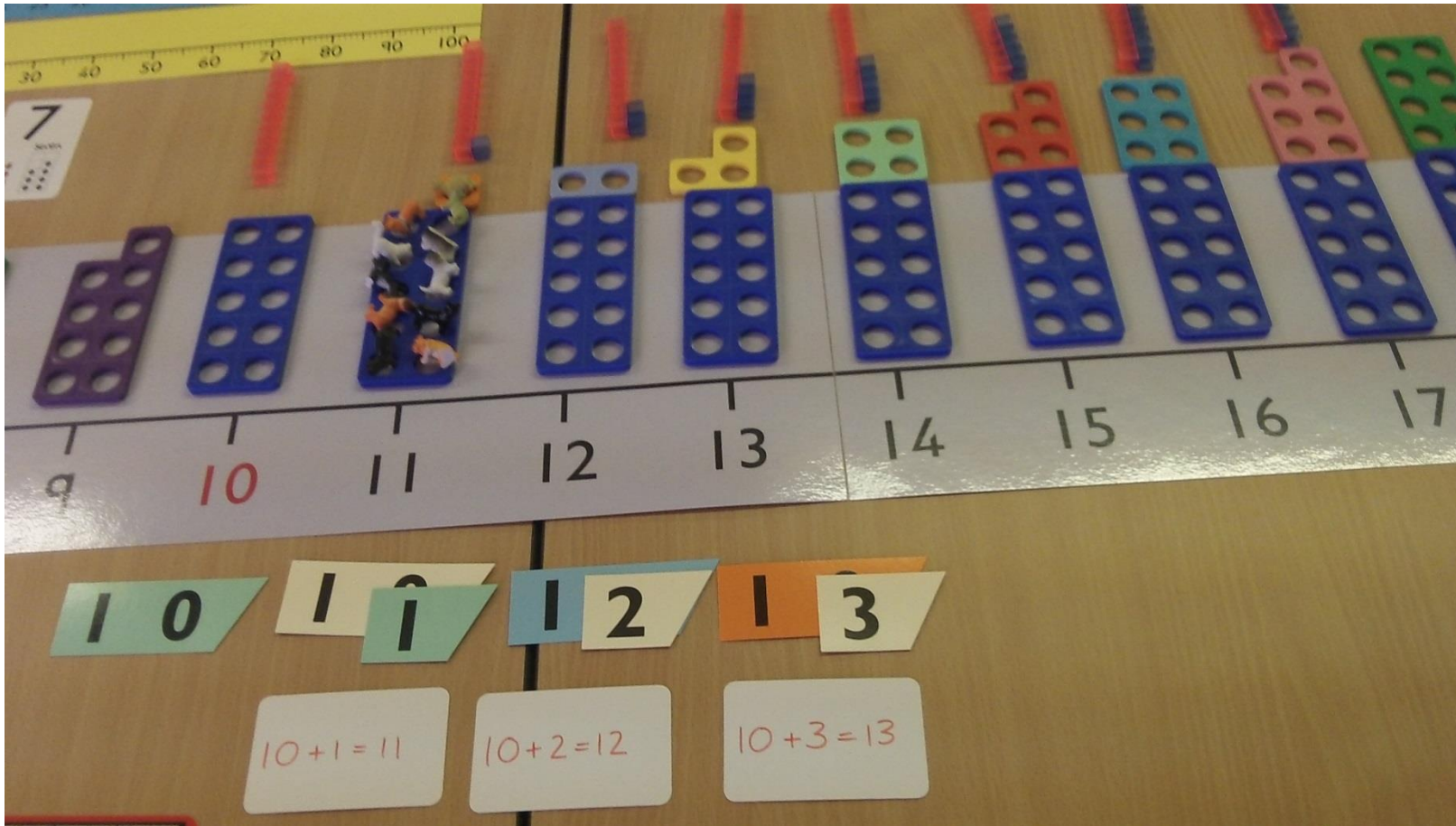
# Pedagogical approach: Concrete Pictorial Abstract (CPA)



A combination of concrete resources supports pupils to make links between number, place value and addition and subtraction...



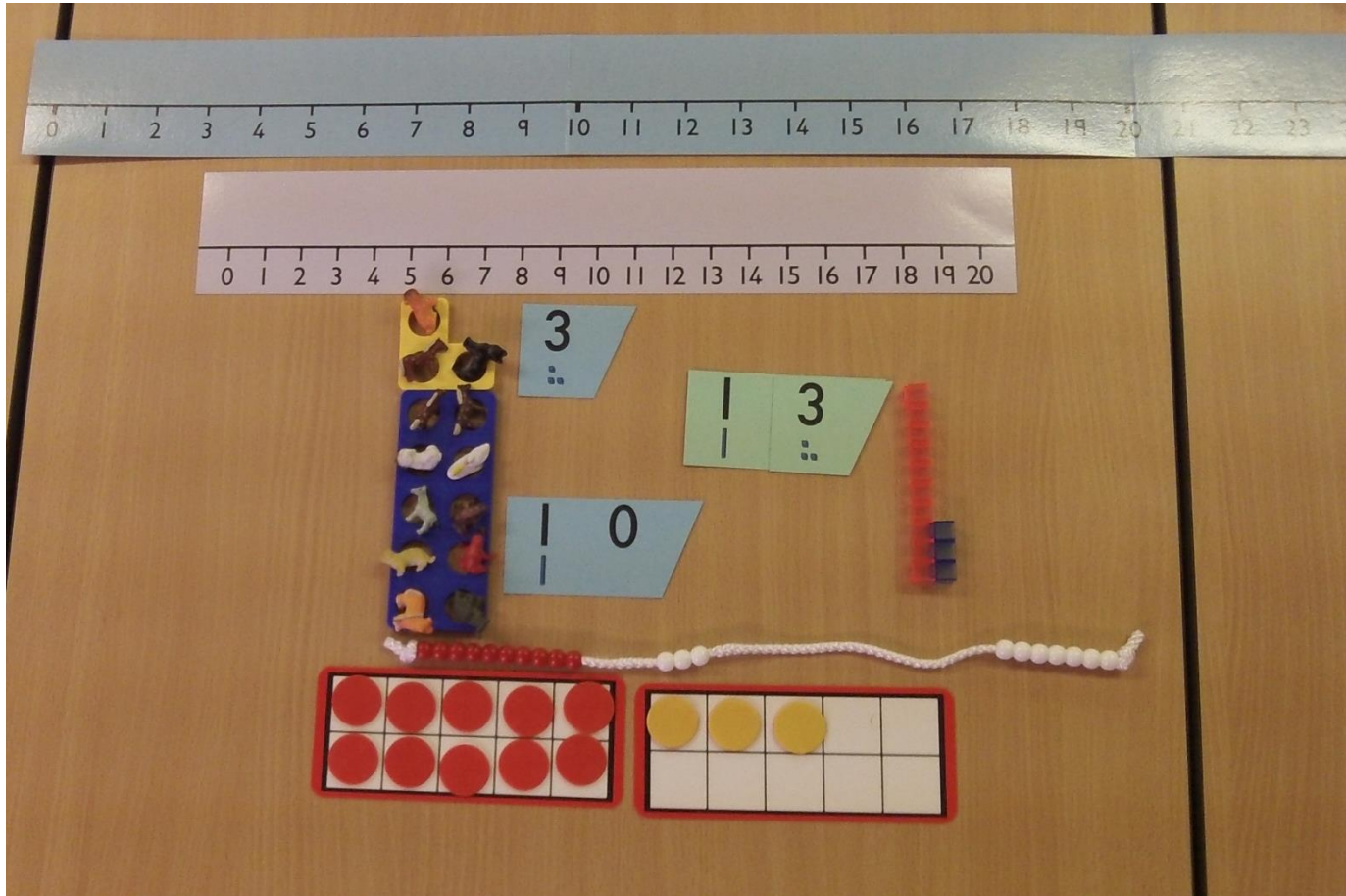
# Concrete Pictorial Abstract (CPA)



‘Teen’ numbers and place value understanding need both cardinal and ordinal focus. Develop pupils’ awareness of pattern and sequences before working with numbers randomly



# Concrete Pictorial Abstract (CPA)



Nominal, ordinal and cardinal understanding is needed for each number



# Number and Place Value

Key aspects of number

- **Counting**
- **Nominal** (reading and writing numbers)
- **Ordinal** (Comparing numbers; understanding place value)
- **Cardinal** (representing numbers, writing numbers; understanding place value)
- **Problem solving**

Key structured mathematical resources

Outcomes from pupil conferencing



# Counting

## Consecutive counting

- Counting on from
- 'Teen'/'ty'
- Number names for multiples of ten
- The number after 100
  
- Counting in fractions...
- ??

## Skip counting

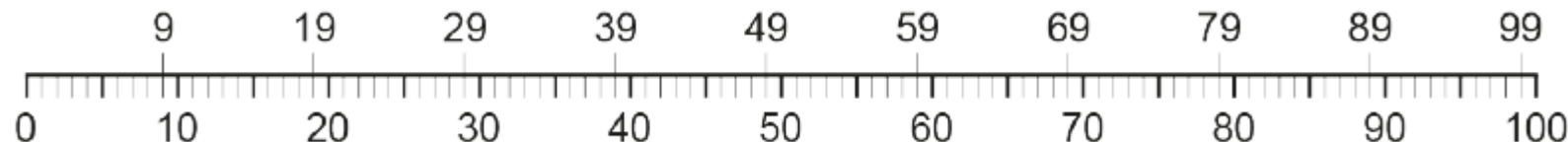
- 2s, 10s, 5s

Important to 'say' and 'do'

Use representations, objects and manipulatives to model what is being said.

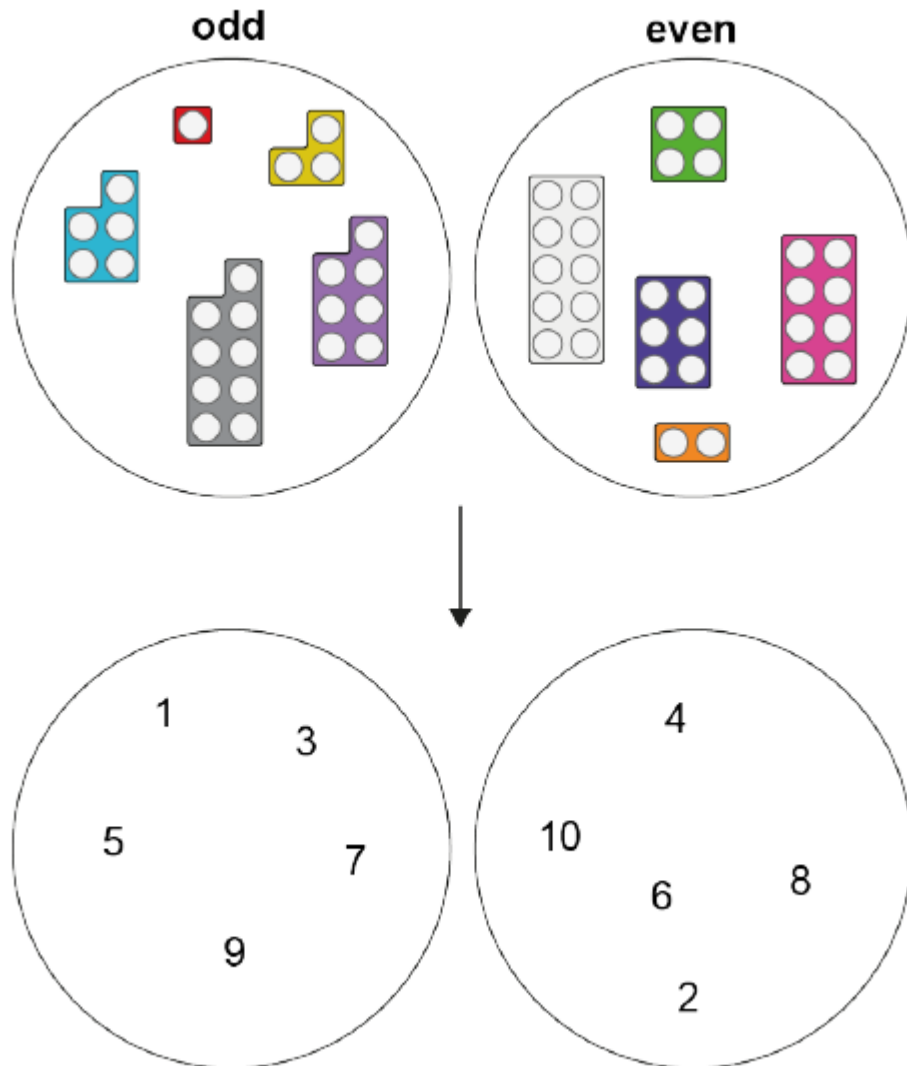
Writing numbers

e.g. Backwards counting supported with a number line image labelling the number before a multiple of ten





# Odd and Even numbers

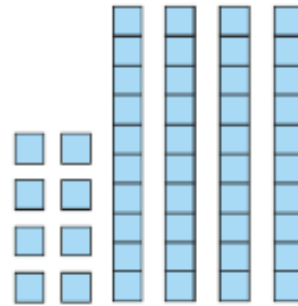
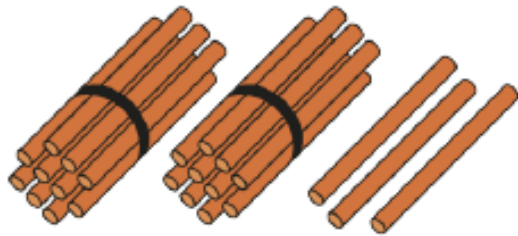


## Year 1

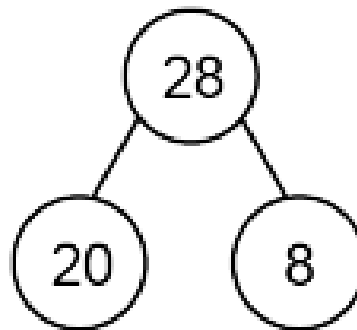
Pupils should learn to recognise odd and even numbers, up to 10, based on whether they can be composed of groups of 2 or not.

Base 10 number boards, or tens frames with counters shown arranged in twos, can be used to expose the structure of odd and even numbers.

# Tens and Units: Year 2



28	
20	8



$$20 + 8 = 28 \quad 28 - 20 = 8$$

$$8 + 20 = 28 \quad 28 - 8 = 20$$

$$28 = 20 + 8 \quad 8 = 28 - 20$$

$$28 = 8 + 20 \quad 20 = 28 - 8$$



# Place value 3 digit numbers: Year 3



'10 tens equals one hundred'

### Language focus

"18 tens is equal to 10 tens and 8 more tens."

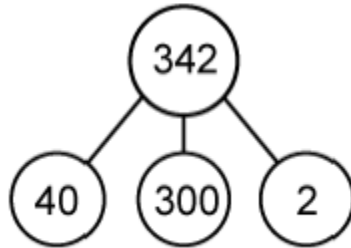
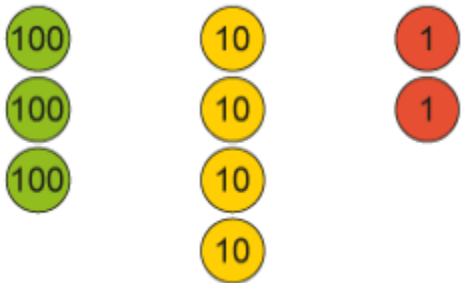
"10 tens is equal to 100."

"So 18 tens is equal to 100 and 8 more tens, which is 180."

100s	10s	1s
		●
	●	
●		

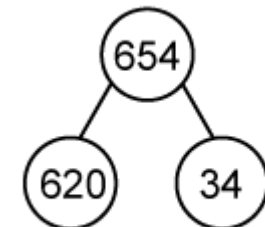
ten times the size    ten times the size

'100 is ten times the size of ten'

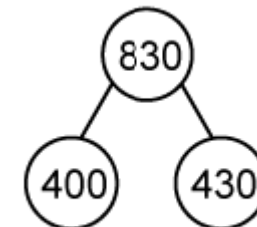


$$342 - 300 = \square$$

$$342 - \square = 302$$



$$620 + 34 = 654$$



$$830 - 400 = 430$$



# Diagnostic interviews from Planning Tool supporting 'assess'

## Counting NPV



<ul style="list-style-type: none"> <li>▪ <b>Oral counting</b> <ul style="list-style-type: none"> <li>○ Can you count to 10, 20, ..... 100? <i>Look for accurate number strings, teens, ty numbers, crossing tens boundaries. Keep going until accurate counting breaks down</i></li> <li>○ Can you count back from 10, 20 in ones?</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Writing numbers</b> <ul style="list-style-type: none"> <li>○ Can you write 2, 5, 8 etc (numbers to 10, numbers to 20, 2 digit numbers to 100)? <i>Look for reversals, lack of confidence, looking at resources to copy numbers from, reversals of 2 digit numbers e.g. 52 ad 25</i></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Number recognition 0 – 10, 20, 100</b> <ul style="list-style-type: none"> <li>○ Can you read this number?</li> <li>○ Can you find this number? <i>Using a set of random digit cards 0 – 20, 100 ... which is number 12? Number 21? .... Can the child find a given number? Clarify 13, 30 and 31.</i></li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>▪ <b>Counting on</b> <ul style="list-style-type: none"> <li>○ Can you follow the counting after me? <i>Start and stop at different points e.g. start at 7 stop at 23</i></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Number before, number after</b> <ul style="list-style-type: none"> <li>○ Can you say the number after / before ... <i>Does the child start at one or can they say the next number in the sequence?</i></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Number sequencing</b> <ul style="list-style-type: none"> <li>○ Can you put these numbers in order from the smallest to the largest? <i>Using a set of consecutive numbers, then a set of random digit cards 0 – 100 (as appropriate) can the child order consecutive numbers then random numbers?</i></li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>▪ <b>Object counting</b> <ul style="list-style-type: none"> <li>○ How many dinosaurs / objects do you think are here?</li> <li>○ Can you count them? <i>Choose a handful e.g. 3 – 10, 10 – 20, 20 – 30 of interesting objects to count e.g. dinosaurs not multilink. Look for accurate counting, moving, touching objects whilst saying the number name – one to one correspondence</i></li> <li>○ Can you give me 6 beads? <i>Does the child know when to stop the count?</i></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Counting in steps</b> <ul style="list-style-type: none"> <li>○ Can you count forward / backward in 2s, 10s? <i>Starting from zero Starting from a single digit number Starting from any number</i></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Place value</b> <ul style="list-style-type: none"> <li>○ Does the child understand the value of each digit in 2 digit (then 3 digit) numbers? <i>Using structured e.g. Numicon, Diennes and unstructured e.g. bundles of straws, bags of 10 objects, coins and arrow cards can the child make the numbers in the previous three sections? Can they talk about the value of the digits and find their position on a structured number line?</i></li> </ul> </li> </ul>

# Pupil Conferencing: diagnostic assessment

- Finding out what pupils **can do** so that this can be used to build on when addressing gaps in curriculum knowledge, errors and misconceptions
- A ‘conversation’ not a ‘test’ – an opportunity to understand the pupils’ reasoning as much as whether they can get a ‘right’ answer
- Focus for the conferencing needs to link to current class based learning
- Can be carried out alongside a pupil in class in short bursts
- Purpose is to inform current teaching and planning
- Needs to be carried out regularly as the pupil makes progress
- Need to consider how to work in partnership with a teaching assistant



# Addition and Subtraction

- **Number bonds** (flexible partitioning; deriving and recalling facts; doubles and halves)
- **Mental calculations** (using facts to estimate and check)
- **Written methods** (say/do/ write when calculating; using symbols; inverse; commutativity)
- **Inverse operations, estimating and checking answers**
- **Problem solving**

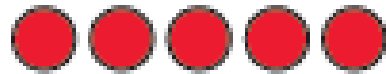
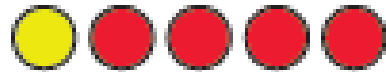
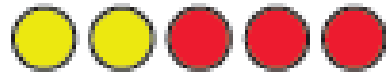
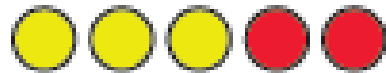
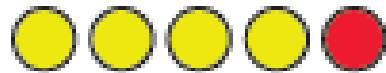
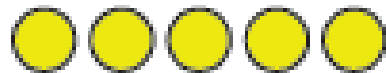
## *Conceptual and procedural fluency*

Key structured concrete resources

Outcomes from pupil conferencing




# Part/ whole reasoning

	$0 + 5 = 5$
	$1 + \square = 5$
	$2 + \square = 5$
	$3 + \square = 5$
	$4 + \square = 5$
	$5 + \square = 5$



$$3 + 4 = 7 \quad 7 - 4 = 3$$

$$4 + 3 = 7 \quad 7 - 3 = 4$$



$1 + 9 = 10$	$6 + 4 = 10$
$2 + 8 = 10$	$7 + 3 = 10$
$3 + 7 = 10$	$8 + 2 = 10$
$4 + 6 = 10$	$9 + 1 = 10$
$5 + 5 = 10$	$10 + 0 = 10$

Can you see these number sentences in the picture below?

$$3 + 2 = 5$$

$$2 + 3 = 5$$

$$5 - 3 = 2$$

$$5 - 2 = 3$$



$3 + \square = 10$	$10 - \square = 7$
$\square + 5 = 10$	$10 - 5 = \square$
$\square + \square = 10$	$10 - \square = \square$

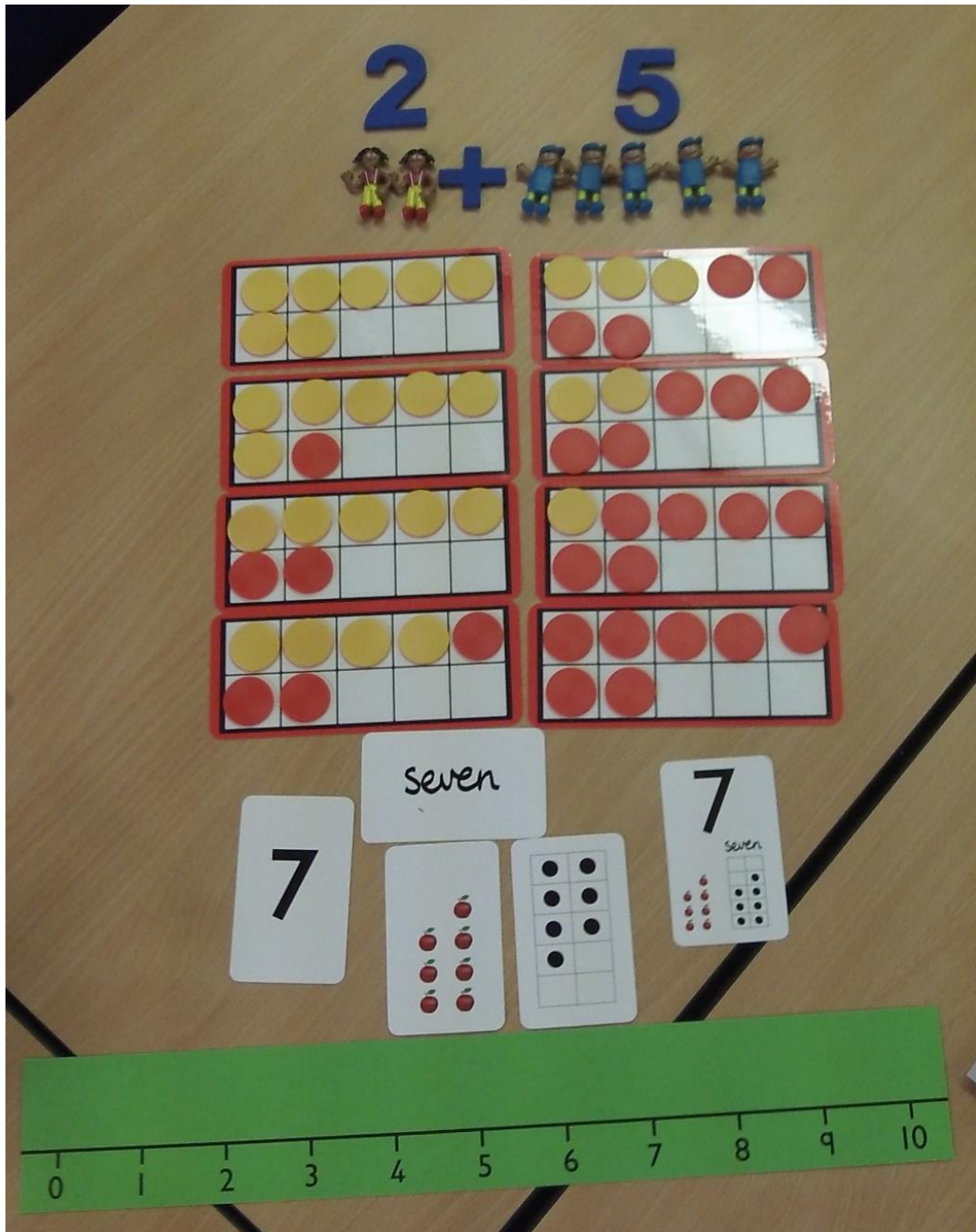


## Develop rich understanding of each number

- Part whole reasoning
- Addition bonds
- Related subtraction
- Multiple representation
- Problem solving involving reasoning using number bonds for seven

Work on the number 8 in the same way...

Later, adding a ten to this will support place value understanding of 'teen' numbers and support 'bridging through ten' when calculating on a number line (addition and subtraction)





# 66 Addition Number facts: foundation for addition and subtraction

+	0	1	2	3	4	5	6	7	8	9	10
0	0+0	0+1	0+2	0+3	0+4	0+5	0+6	0+7	0+8	0+9	0+10
1	1+0	1+1	1+2	1+3	1+4	1+5	1+6	1+7	1+8	1+9	
2	2+0	2+1	2+2	2+3	2+4	2+5	2+6	2+7	2+8		
3	3+0	3+1	3+2	3+3	3+4	3+5	3+6	3+7			
4	4+0	4+1	4+2	4+3	4+4	4+5	4+6				
5	5+0	5+1	5+2	5+3	5+4	5+5					
6	6+0	6+1	6+2	6+3	6+4						
7	7+0	7+1	7+2	7+3							
8	8+0	8+1	8+2								
9	9+0	9+1									
10	10+0										

- **add and subtract within 10, fluently, by the end of year 1.**
- taught and practised until pupils move beyond counting forwards or backwards in ones, to more efficient strategies and eventually to automatic recall of these number facts.
- necessary before pupils move on to additive calculation with larger numbers.
- The number of addition facts reduced when commutativity applied- pupils recognise that  $3 + 2$ , for example, is the same as  $2 + 3$ .
- Pupils must also have automatic recall of the corresponding subtraction facts, for example  $5 - 3$  and  $5 - 2$ .

# Reasoning about number facts

## Example strategy 1:

### Language focus

“I know that double 3 is equal to 6, so 4 plus 3 is equal to 7.”

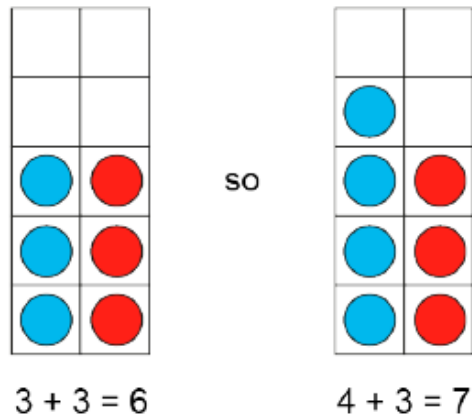


Figure 8: tens frames with counters showing derivation of a ‘near-double’ addition calculation

## Example strategy 2:

### Language focus

“If I subtract 2 from an even number I get the previous even number, so 6 minus 2 is equal to 4.”

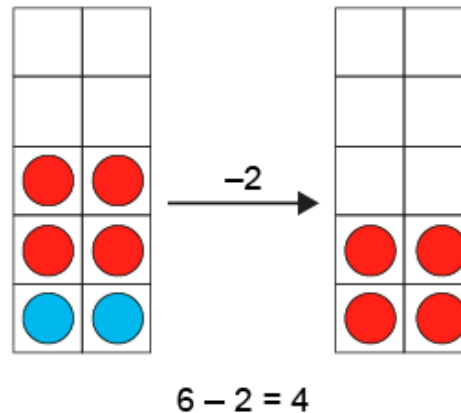
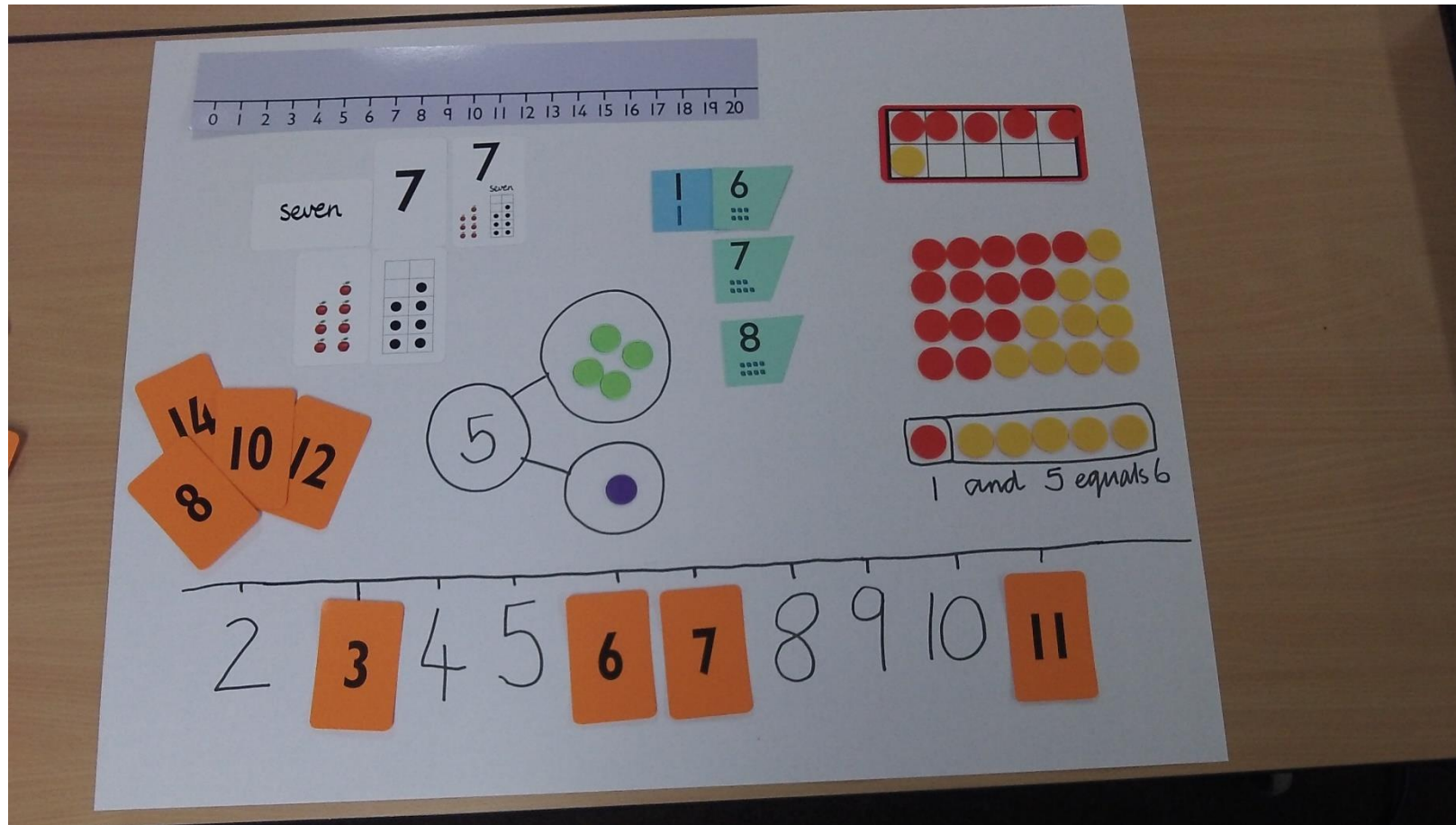


Figure 9: tens frames with counters showing that subtracting 2 from an even number gives the previous even number

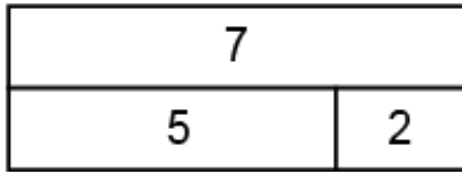
Using a CPA approach, pupils should be taught to derive addition facts using those they know and can recall



# Number and Place Value Addition and Subtraction

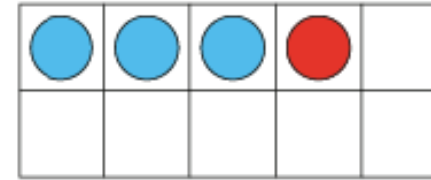


# Representations: from Year 1



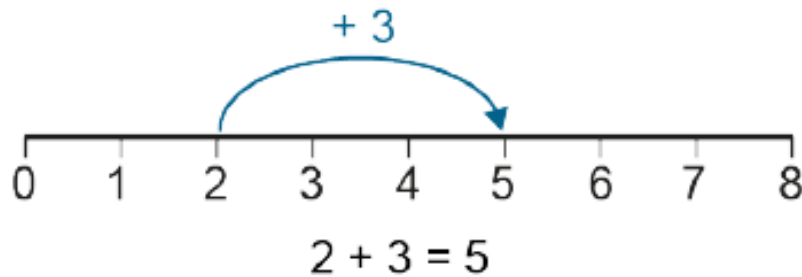
$$7 - 2 = 5$$

Bar model

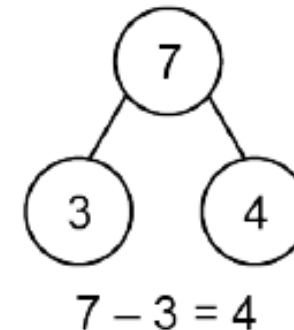


$$3 + 1 = 4$$

Tens frame



Number line



Cherry partitioning model

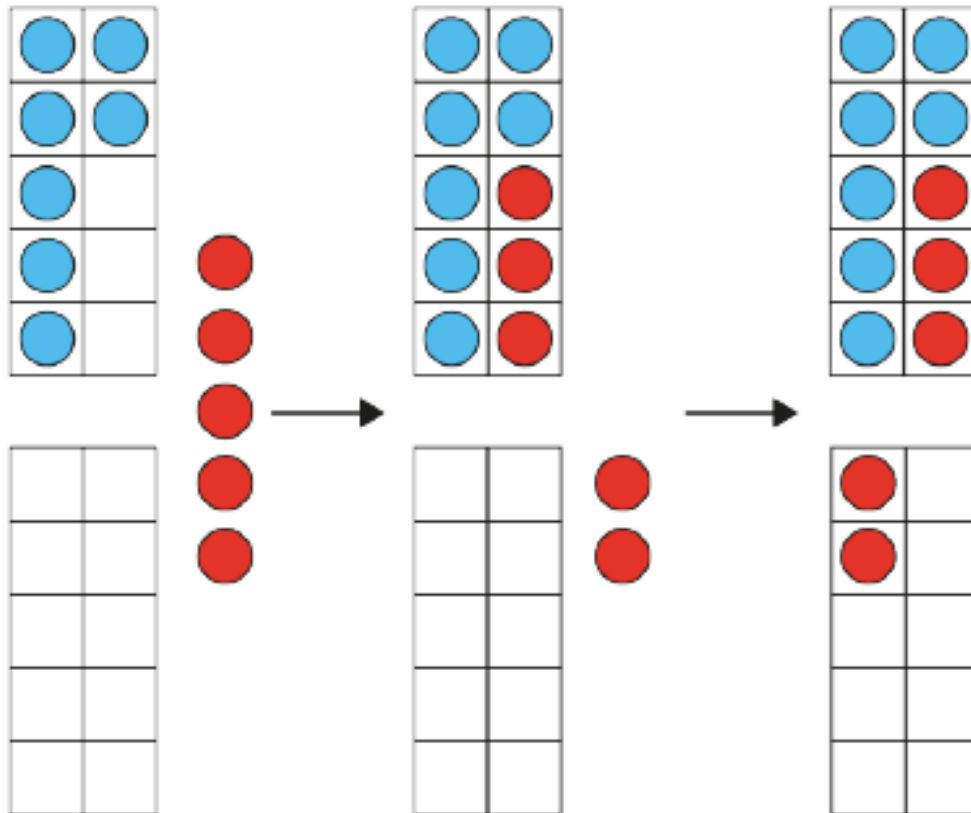


# Add and subtract across 10

Year 2

E.g.  $7 + 5$

- Add 3 one digit numbers first
- Progress to adding two numbers, partitioning the second number



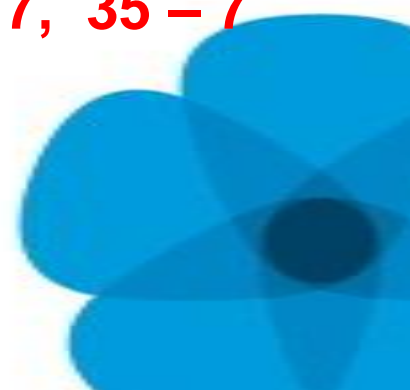
# Scaffolding the skills...with understanding...

- Adding 2 single digit numbers (bridging through ten) e.g.  $8 + 7$
- A 2-digit number and ones (no bridging +/-) e.g.  $24 + 5$ ,  $38 - 6$
- A 2-digit number and ten (+ / -) e.g.  $34 + 10$ ,  $68 - 10$
- A 2-digit number and a multiple of ten (+/-) e.g.  $18 + 30$ ,  $56 - 40$
- A 2-digit number add a single digit – with bridging e.g.  $18 + 7$ ,  $35 + 7$
- A 2-digit number subtract a single digit number – with bridging e.g.  $24 - 6$ ,  $33 - 8$ ,
- A 2-digit number add a two digit number without bridging – e.g.  $23 + 16$
- A 2-digit number subtract a two digit number without bridging – e.g.  $47 - 25$
- A 2-digit number add a 2 digit number with bridging – e.g.  $24 + 47$ ,  $18 + 27$ ,  $48 + 35$
- A 2-digit number subtract a 2-digit number with bridging – e.g.  $72 - 17$ ,  $35 - 7$



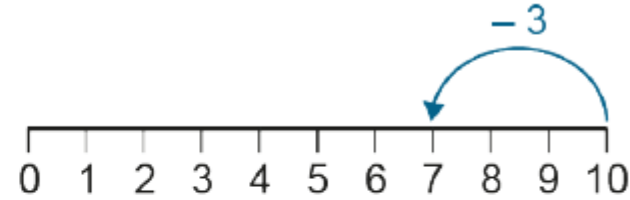
# Scaffolding the skills...with understanding...

- Adding 2 single digit numbers (bridging through ten) e.g.  $8 + 7$
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- **A 2-digit number and ten (+ / -)** e.g.  $34 + 10$ ,  $68 - 10$
- **A 2-digit number and a multiple of ten (+/-)** e.g.  $18 + 30$ ,  $56 - 40$
- A 2-digit number add a single digit – with bridging e.g.  $18 + 7$ ,  $35 + 7$
- A 2-digit number subtract a single digit number – with bridging e.g.  $24 - 6$ ,  $33 - 8$ ,
- **A 2-digit number add a two digit number without bridging – e.g.  $23 + 16$**
- **A 2-digit number subtract a two digit number without bridging – e.g.  $47 - 25$**
- **A 2-digit number add a 2 digit number with bridging – e.g.  $24 + 47$ ,  $18 + 27$ ,  $48 + 35$**
- **A 2-digit number subtract a 2-digit number with bridging – e.g.  $72 - 17$ ,  $35 - 7$**

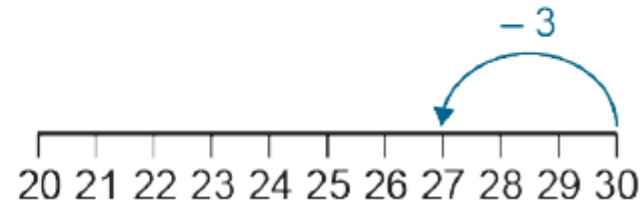


# Deriving Facts: Year 2

$$10 - 3 = 7$$



$$30 - 3 = 27$$



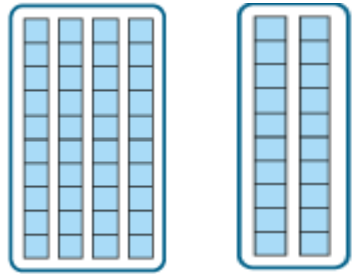
Subtracting a unit from a multiple of 10

Using a CPA approach understanding  $10 - 3$  and  $30 - 3$  are part of a pattern in calculation

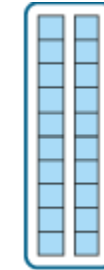
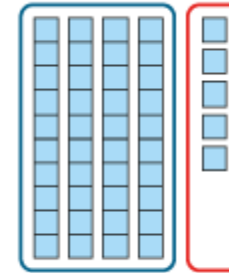




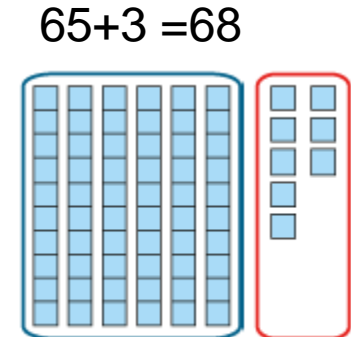
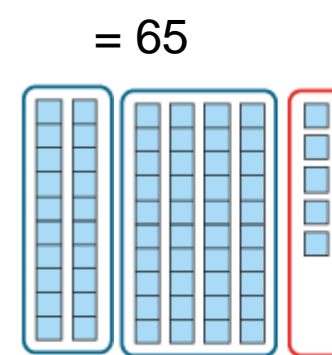
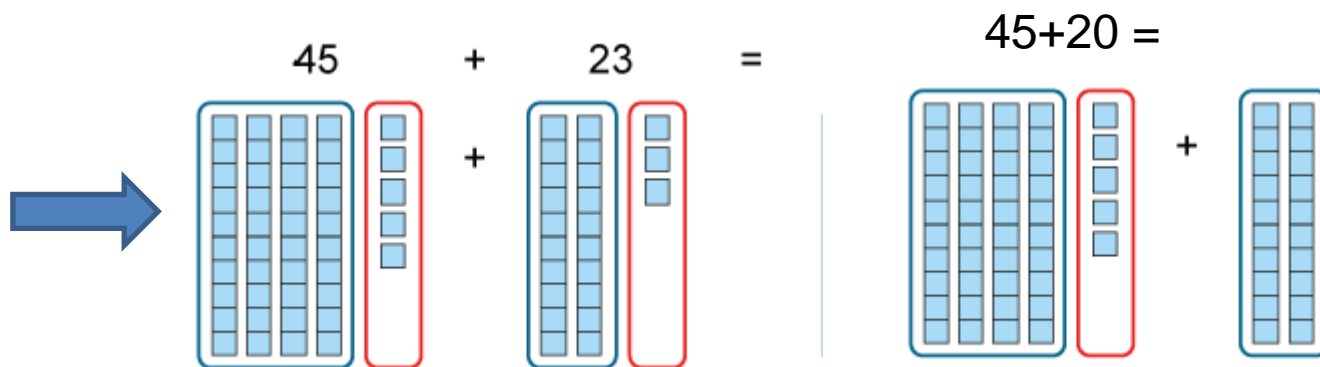
# Add and subtract within 100



Multiples of 10 eg  $40 + 20 = 60$   
 $4 \text{ tens} + 2 \text{ tens} = 6 \text{ tens} (4+2=6)$



Tens and units and  
multiples of 10  
eg  $45 + 20$



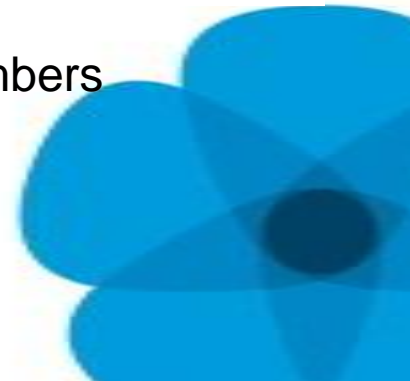
Subtraction follows same progression and strategy :  
subtract multiples of 10 first then the units e.g.

$$65 - 23 =$$

$$65 - 20 = 45$$

$$45 - 3 = 42$$

Adding two 2-digit numbers  
– no re-grouping



# Pupil conferencing questions: addition and subtraction

**Addition: If I have 4 dinosaurs and 3 more come along, how many will I have altogether?**

(5 add 3, 9 +4, 9+10, 13 +9, 13 +19 etc)

Does the child:

- use objects, count both sets
- use pictorial recording
- write a number sentence to match the calculation needed
- count on in ones
- use known number facts
- count on from the biggest number
- count on using a structured number line
- count on in tens/ones using an empty number line
- use any other recording to help with the calculation?

**Subtraction: If I have 7 dinosaurs and 4 go off for a walk, how many will I have left?**

(8 subtract 4, 10-7, 23-4, 23-10)

Does the child:

- use objects, count a set, take some away, count how many are left?
- use pictorial recording
- write a number sentence to match the calculation needed
- count back in ones
- count back in ones using a structured number line
- use known number facts
- count back in tens/ ones using a empty number line
- count on when appropriate
- use any other recording to help with the calculation?



# Finding starting point to work towards NC statements e.g. NPV, addition and subtraction

Using day to day assessment and any specific conferencing to identify the correct planning tool ie Y1, Y2 or Y3 in this domain for the pupil.

- Start from year 1 and work up.
- Use domain non- statutory guidance and ‘key concepts’
  - *E.g. For this domain this pupil is working towards end of year 2 expectations*
- Select from the domain strands key aspects to work on so that there is a linked combination of those strands in the bespoke plan.

## National Curriculum written assuming previous knowledge and skills understood

### Number and Place Value

#### Year 1: National Curriculum notes and guidance (non-statutory)

Pupils practise counting (1, 2, 3...), ordering, (eg first, second, third...), and to indicate a quantity, (eg 3 apples, 2 centimetres), including solving simple concrete problems, until they are fluent.

Pupils begin to recognise place value in numbers beyond 20 by reading, writing, counting and comparing numbers up to 100, supported by objects and pictorial representations.

They practise counting as reciting numbers and counting as enumerating objects, and counting in twos, fives and tens from different multiples to develop their recognition of patterns in the number system, (eg odd and even numbers), including varied and frequent practice through increasingly complex questions.

They recognise and create repeating patterns with objects and with shapes.

### Key concepts

- The order of numbers enables comparison between numbers.
- As you count on the quantity represented by the number becomes larger and becomes smaller as you count back.
- Numbers greater than 9 are formed by combining more than one digit and numbers between 10 and 20 start with a ‘1’.
- The position of a digit in a number indicates its value.
- The place value system is based on units of 10.
- Knowing number names /reading teens numbers can be confusing in terms of place value, eg 11, 12, 13, 14.

### Curriculum strands

Within the document, the national curriculum programme of study domain number and place value is broken down into smaller curriculum strands to support precise identification of need. The curriculum strands identified are:

- counting
- comparing numbers
- identifying, representing and estimating numbers
- reading and writing numbers
- understanding place value

### Problem-solving

Teacher assessment should consider to what extent the pupil is able to apply conceptual understanding to solve problems.



# Which of these prompts help to create a bespoke target for the pupil?

Skills, knowledge and concepts		NC expectations – Year 1
Use recall of number bonds to check solutions (addition) 3-7 (8-10, 11-20).	Group calculations into solutions > < then = to 10.	<ul style="list-style-type: none"> <li>• Add and subtract one-digit and two-digit numbers to 20, including zero</li> <li>• Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs</li> </ul>
Use recall of number bonds to check solutions (subtraction) 3-7 (8-10, 11-20).	Uses inverse to solve missing box calculations using number bonds 3-7 (8-10, 11-20).	
Use known fact to solve related fact ,eg if $3 + 4 = 7$ then $3 + 5$ must be 8.	Identify calculations that can be worked out easily with counting forwards/ backwards, ie $+1$ , $+2$ , $+/-3$ .	

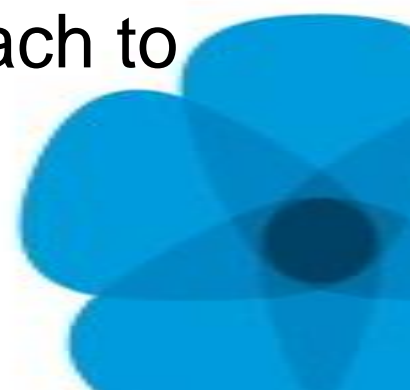
Pupils need to

- use models and images, concrete resources and signs and symbol notation
- discuss/ model their reasoning to support independence
- engage in problem solving tasks

# High Quality Inclusive teaching

Building a coherent analysis of pupils' needs in each domain enables teachers to adapt tasks that:

- provide appropriate level of challenge
- address gaps in curriculum knowledge, errors or misconceptions
- precisely focus practise leading to greater independence and fluency
- are 'problematic' requiring pupils to 'use what they know' and develop problem solving strategies including a CPA approach to recording solutions



$$156 - 8 =$$

Can the pupil:

- count accurately to at least 200?
- Read the calculation using different vocabulary?
- Recall number bonds for 8?
- Draw and use a representation (s) to help them keep track of their reasoning?
- Use their knowledge of number bonds to make this calculation easier than counting back in ones on their fingers?
- ?

Possible variations

$$50 - 8$$

$$58 - 8$$

$$150 - 8$$

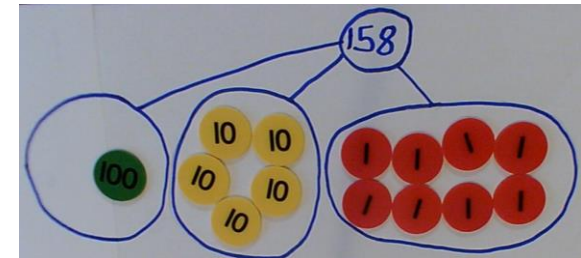
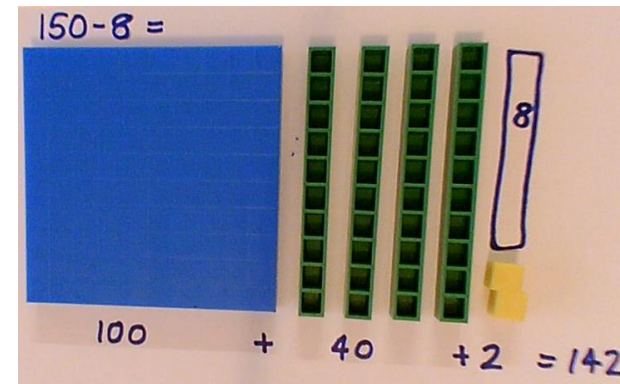
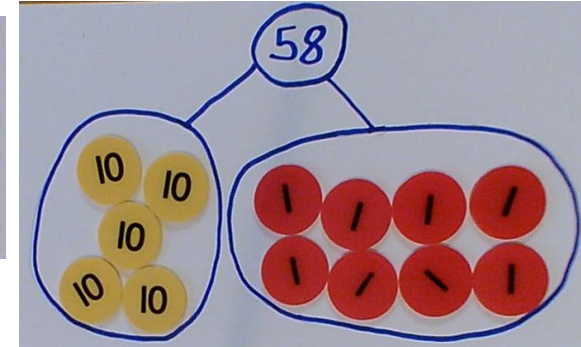
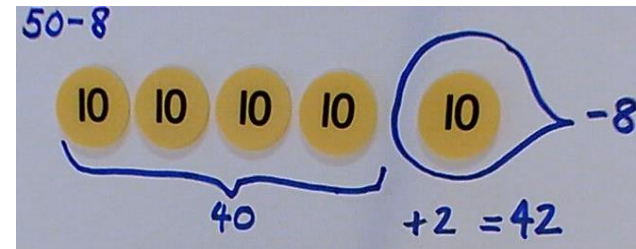
$$158 - 8$$

$$57 - 8$$

$$157 - 8$$

$$156 - 8$$

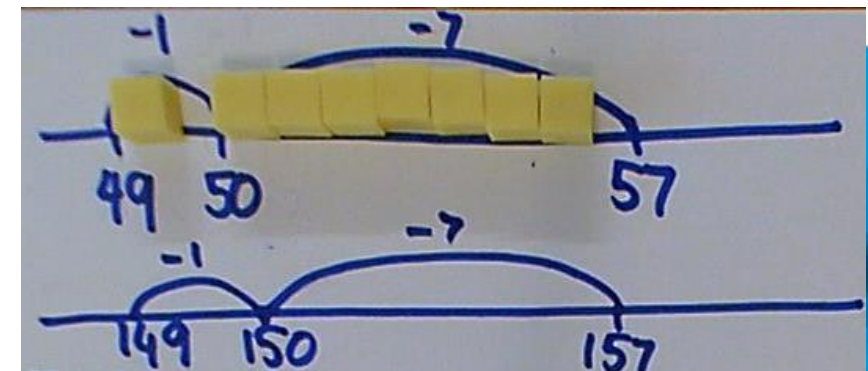
Scaffolding needed until fluent with the underlying ideas.



Can the pupil see a link with

$$156 + 8 =$$

What strategies will be used to support and develop pupil talk?



# Key Stage 2 Pupils with SEND in maths

## Subject knowledge about the progression from Y1 – Y3/4 particularly important

- Counting and place value understanding: 0-20, 0-100, 0-1000
- Consistent use of representations and manipulatives from Y1 –Y6 particularly number lines (decimals, fractions and measure need number line model)
- Build understanding of ‘facts and related facts’ linked to ‘part whole’ reasoning about all four operations
- Check for variations of the task that meet the needs of the learner
  - tracking back far enough rather than over supporting the learner to be able to get the answer to a task that is fundamentally too difficult eg a Y5 pupil might need tasks that are based in year 2 curriculum etc
- Check for understanding of the task rather than support to get the ‘right answer’
- Check for independence and mastery over a few lessons and then successful retrieval over longer periods of time

# Word Problems

**The postman has 157 cards to deliver. The postman has already delivered eight. How many did he have left to deliver?**

Can the pupil:

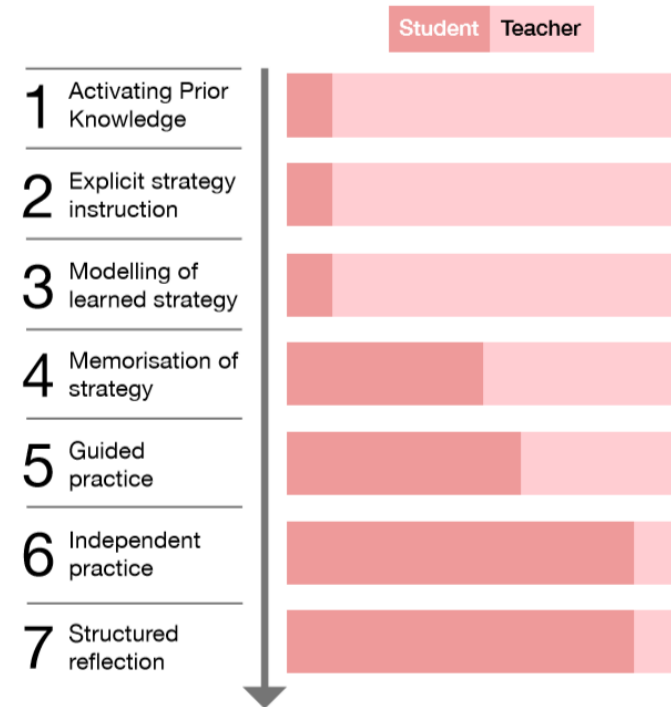
- Read the problem independently
- Explain the problem accurately
- Draw a representation of the problem?
- Identify the first step?
- Identify the expression or equation needed
- Identify a calculation strategy?
- Decide whether their answer is reasonable?



- **Identify the explicit teaching needed**
- **Provide a bespoke scaffold**
- **Use 7 step journey to securing understanding**

**What are some of the potential challenges?**

- Several bits of information
- Vocab: 'deliver' 'delivered' related to a maths operation
- Number as word
- The 'question' not separated from the rest of the information





The postman has 157 cards to deliver.  
The postman has already delivered eight.  
How many did he have left to deliver?

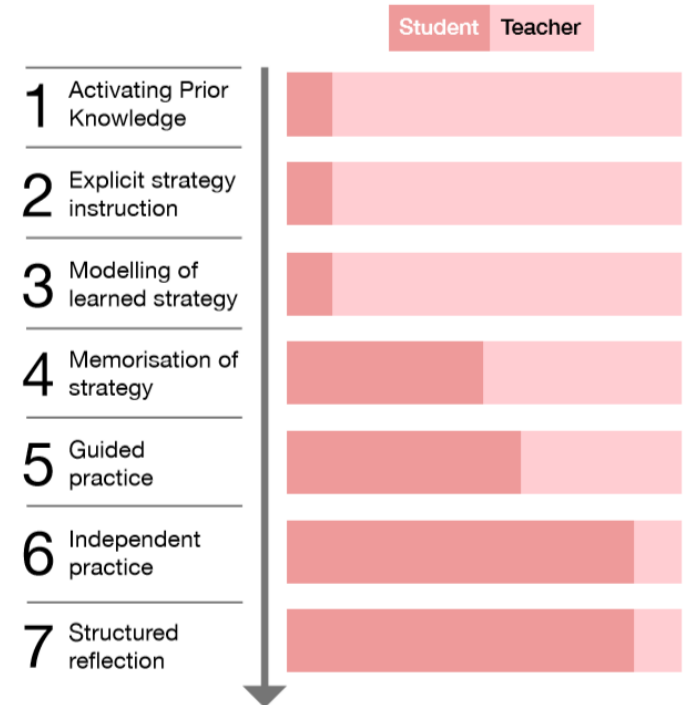


**There are 157 cards to deliver. The postman delivered eighteen in the first road and 12 cards in the next road. How many cards are still left to be delivered?**

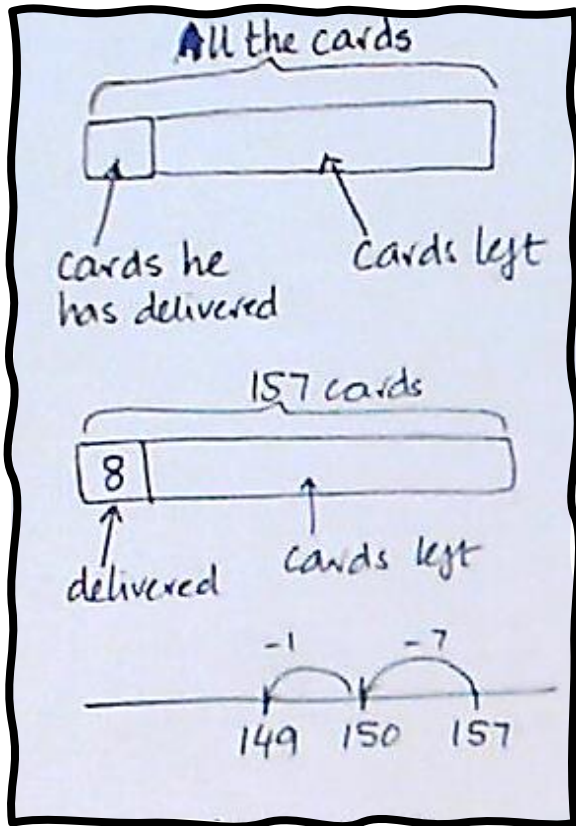
This two –step problem is more accessible if I have successful understood the previous one

Can the pupil:

- Read the problem independently
- Explain the problem accurately
- Draw a representation of the problem?
- Identify the steps needed?
- Identify the expression or equation needed for each step
- Identify a calculation strategy?
- Decide whether their answer is reasonable?
- Consider an alternative solution?



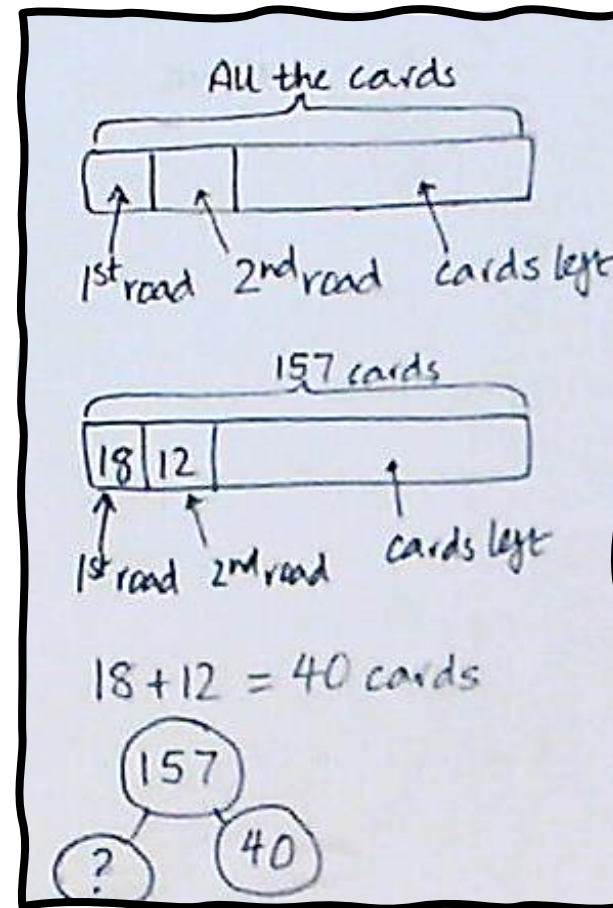
# Scaffolded version for solution



$157 - 8 \text{ cards} = \text{cards left}$

$157 - 8 \text{ cards} = 149 \text{ cards left}$

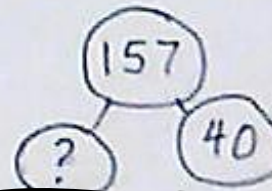
Check:  $149 + 8 = 157 \text{ cards}$



$18 + 12 = \text{cards delivered}$

$157 - 40 \text{ cards} = 117 \text{ cards left}$

$18 + 12 = 40 \text{ cards}$



# Examples of pupil work

NPV

Addition and subtraction



# Multi representation of number

LO: to use my knowledge of place value

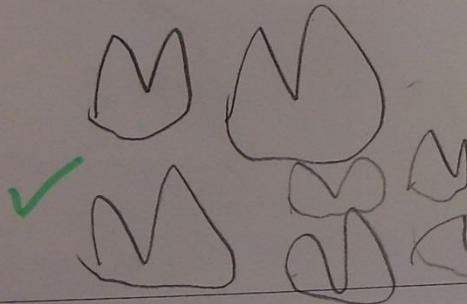
Write the number of toys in words

~~7014~~

seven

7 toys

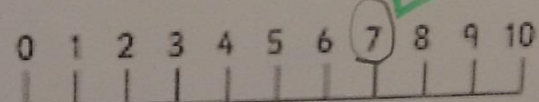
Draw it



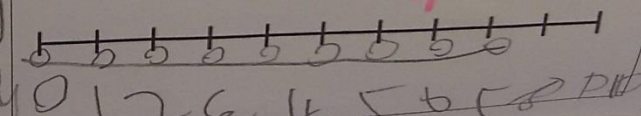
1 more toy 8 ✓

1 less toy 6 ✓

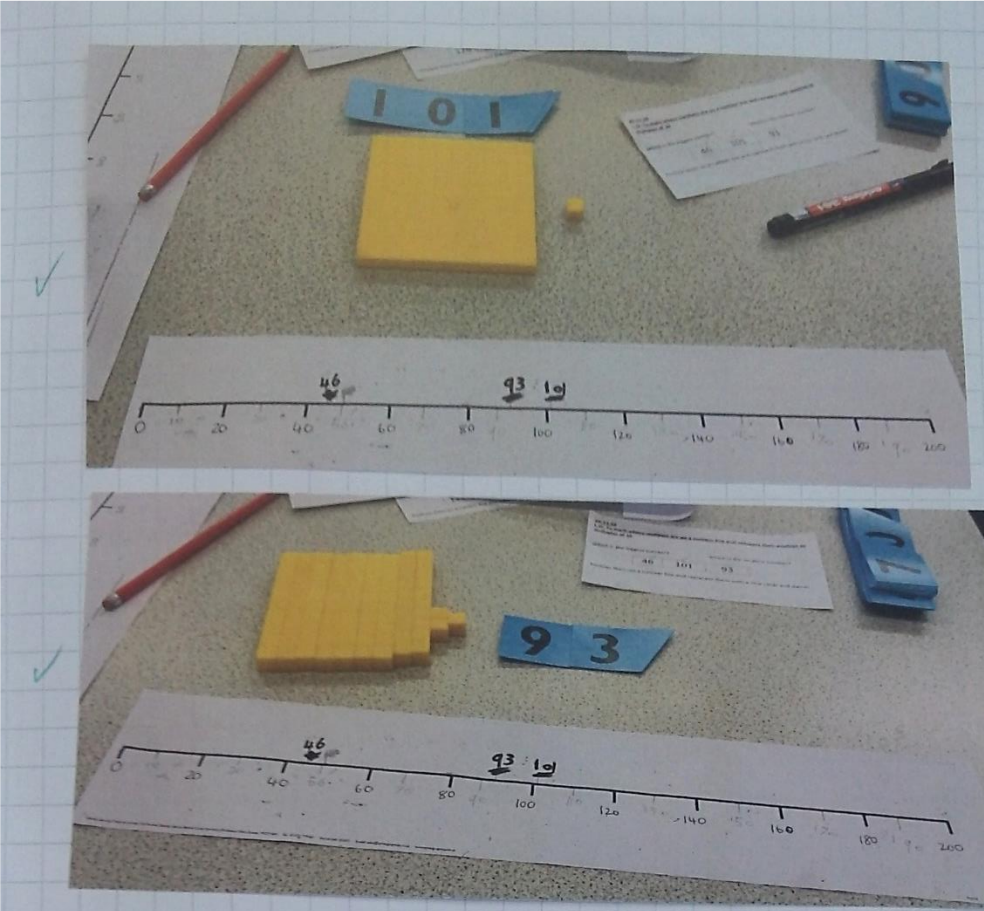
Circle the number of toys on a number line



Place the number of toys on a number line




# Year 5



Which is the biggest number?      Which is the smallest number?

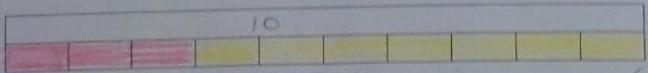
65	105	95
----	-----	----

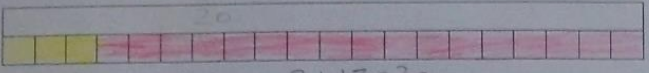
Position them on a number line and represent them with arrow cards and dienes.



# Year 5

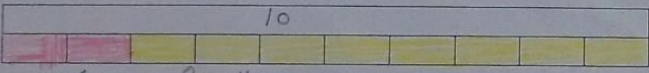
L.O. To recall number bonds to 10 and 20.  
 3110 Lily-Rose → Looking for links between number bonds to 10 and 20


(S)  10  
 3 pink 7 yellow  $3+7=10$  ✓

 20  
 3 yellow 17 pink  $3+17=20$  ✓

"They both have the same number of ones"

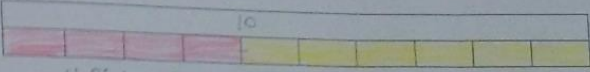
(S)  $3+7=10$   
 $3+17=20$

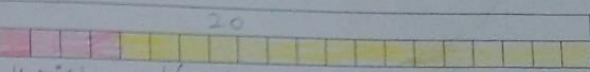
 10  
 2 pink 8 yellow  $2+8=10$  ✓

 20  
 2 yellow 18 pink  $2+18=20$  ✓

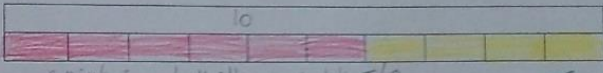
(I) "They both number 2 in it and the similar one is that in the 10 column for 8+ it has 10 in it and for 2+18 it does has 10 in it."  
 $2+8=10$

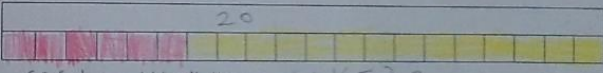
number bonds to 10 and 20

 10  
 4 pink 6 yellow  $4+6=10$  ✓

 20  
 4 pink 16 yellow  $4+16=20$  ✓

"they both have number 4 in it and it is similar that they have  
 $4+6=10$   
 $4+16=20$  ✓

 10  
 6 pink 4 yellow  $6+4=10$  ✓

 20  
 6 pink 14 yellow  $6+14=20$  ✓

"they both have the same number of ones"  
 $6+4=10$   
 $6+14=20$

great vocab!



# Year 5 September work

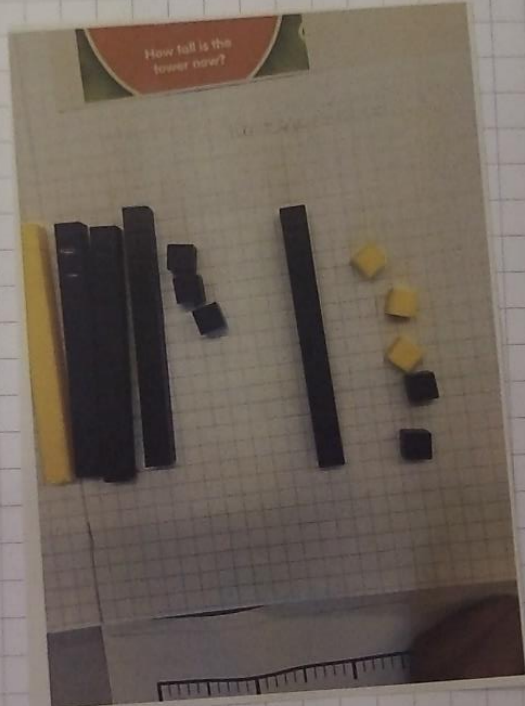
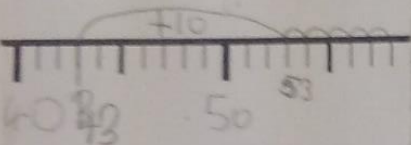
27.09.19 ✓✓  
L.O: Use concrete resources, and structured number lines to solve addition calculations (TU+TU) using + and = signs  
Identify addition number sentence to solve a simple word problem 0-100  
APPLY

Charlie builds a tower using 1cm cubes that is 43cm tall. He adds 15cm to his tower.  
How tall is the tower now?

$43 + 15 = 58\text{cm}$

$10\text{cm} + 43\text{cm} + 15\text{cm} = 58\text{cm}$

$43 + 15 =$



Reasoning task – variation of whole class work

CPA approach

Continue to use knowledge and skills related to previous unit on NPV

Pupil organises images on page



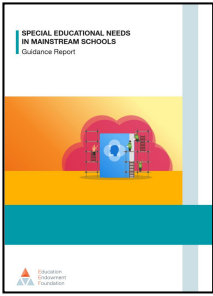
# Special Educational Needs in Mainstream Schools Guidance Report

- 
- Recommendation 1      Create a positive and supportive environment for all pupils, without exception
- 
- Recommendation 2      Build an ongoing, holistic understanding of your pupils and their needs
- 
- Recommendation 3      Ensure all pupils have access to high quality teaching
- 
- Recommendation 4      Complement high quality teaching with carefully selected small-group and one-to-one interventions
- 
- Recommendation 5      Work effectively with teaching assistants

SPECIAL EDUCATIONAL NEEDS  
IN MAINSTREAM SCHOOLS  
Guidance Report

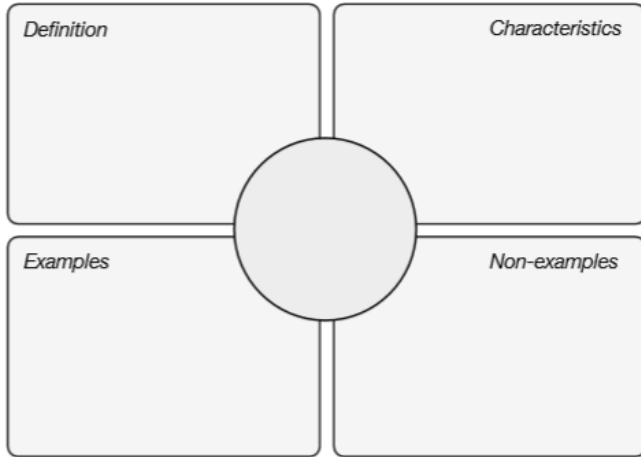




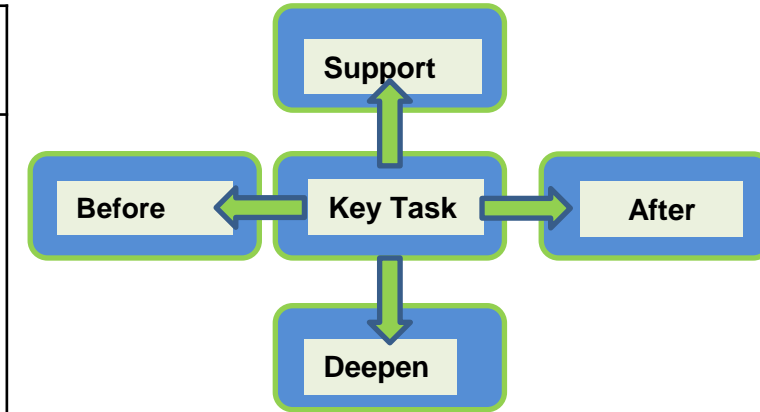


# Examples of High Quality Teaching strategies

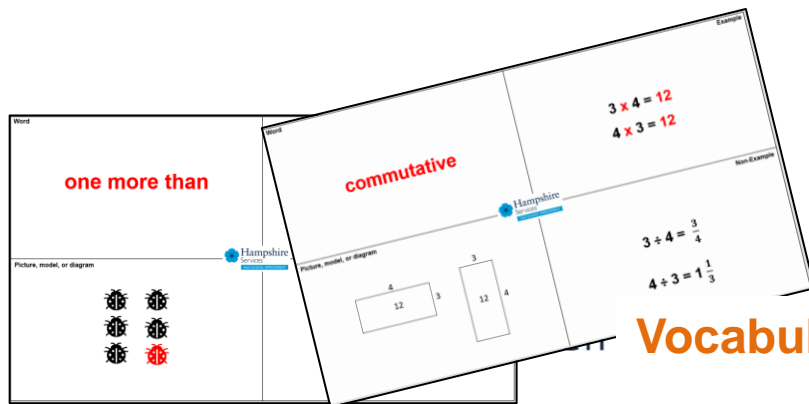
## Scaffolding problem solving: Core Provision



<u>PROBLEM</u>	
<u>Step 1 (2,3) etc</u> <u>MODEL</u>	<u>CALCULATIONS</u>



**Graphic Organisers:** Frayer model  
Used to organise concepts, knowledge and ideas also includes Venn Diagrams



**Vocabulary cards – new on Moodle Plus**

- Explicit Teaching instruction** eg Rosenshine’s Principles Teaching skills and concepts in small steps;
- using examples and non-examples;
  - using clear and unambiguous language;
  - anticipating and planning for common misconceptions; and
  - highlighting essential content and removing distracting information.



# Action Planning

Next steps



# Sharing the Planning Tool

## How will you...

- Disseminate the key principles to all of the staff using the document?
- Ensure that all teachers are confident in how to use/ apply it?
- Overcome barriers and problems that teachers may experience when planning/ teaching children with SEND?
- Share successes and best practice?
- Track the progress of children with SEND?



# Ideas

- Lesson study – a collaborative plan/teach/review cycle focusing on just the pupils with SEND
- A snowball model – train some members of staff up to be experts, then they support others
- A cascade model – share with everyone and then monitor successes by providing opportunities for feedback/ review
- A pilot – trial the planning tool with a small group of teachers for a given period of time then meet to share any barriers/ best practice before sharing with others



# Key documents: end of key stage 1 and 2 assessment

## STA pre KS1 and KS2

The pre-key stage standards are provided for the statutory assessment of pupils engaged in subject-specific study who are working below the overall standard of the national curriculum tests and teacher assessment frameworks.

The pre-key stage standards focus on certain key aspects of mathematics for the specific purpose of statutory end-of-key stage assessment.

‘The standards are not a formative assessment tool: they should not be used to track progress throughout the key stage or to guide individual programmes of study, classroom practice or methodology. Teachers should assess individual pieces of pupils’ work in line with their school’s own, more detailed, assessment policy and not against these standards.

**Those reviewing school performance, including Ofsted inspectors, would not expect them to be used for anything other than summative assessment at the end of the key stage.’**

