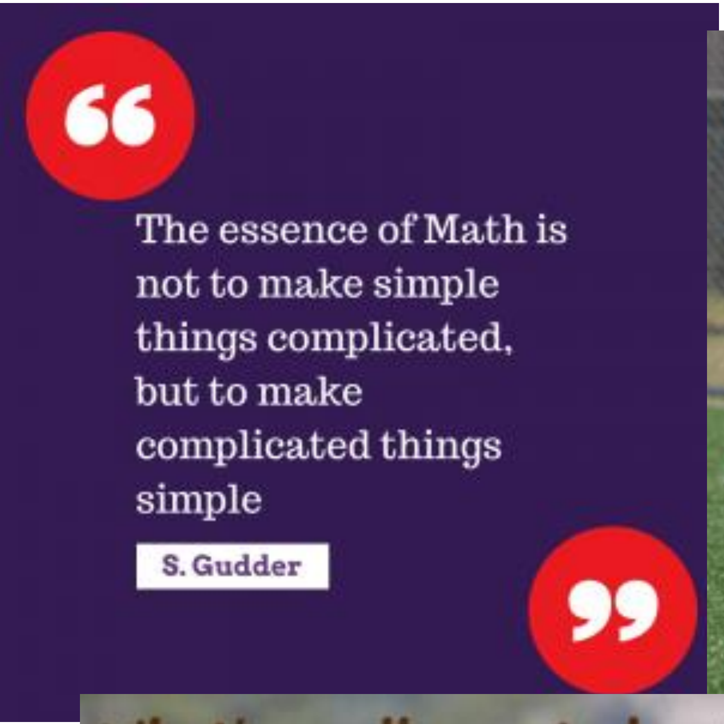
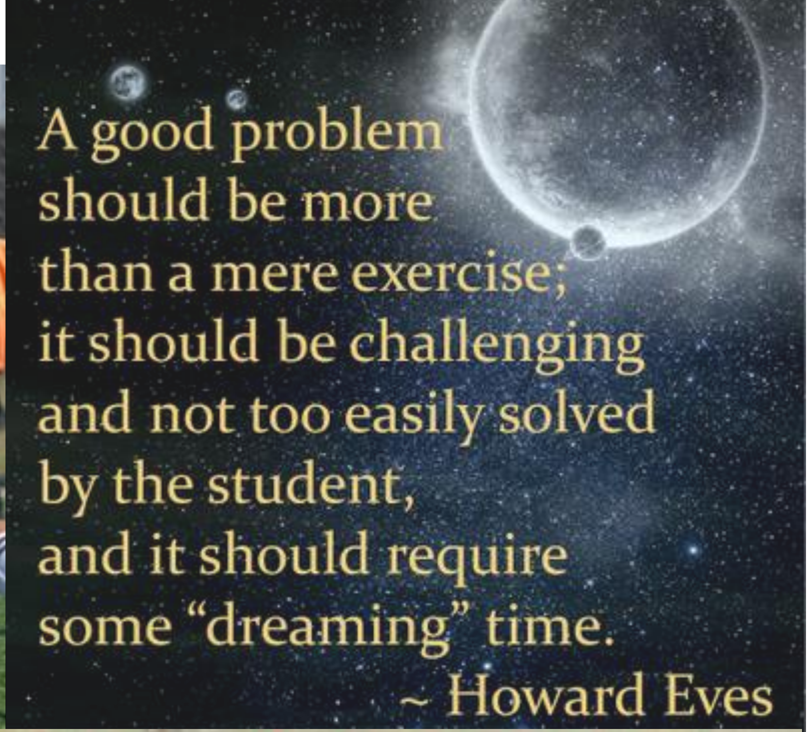
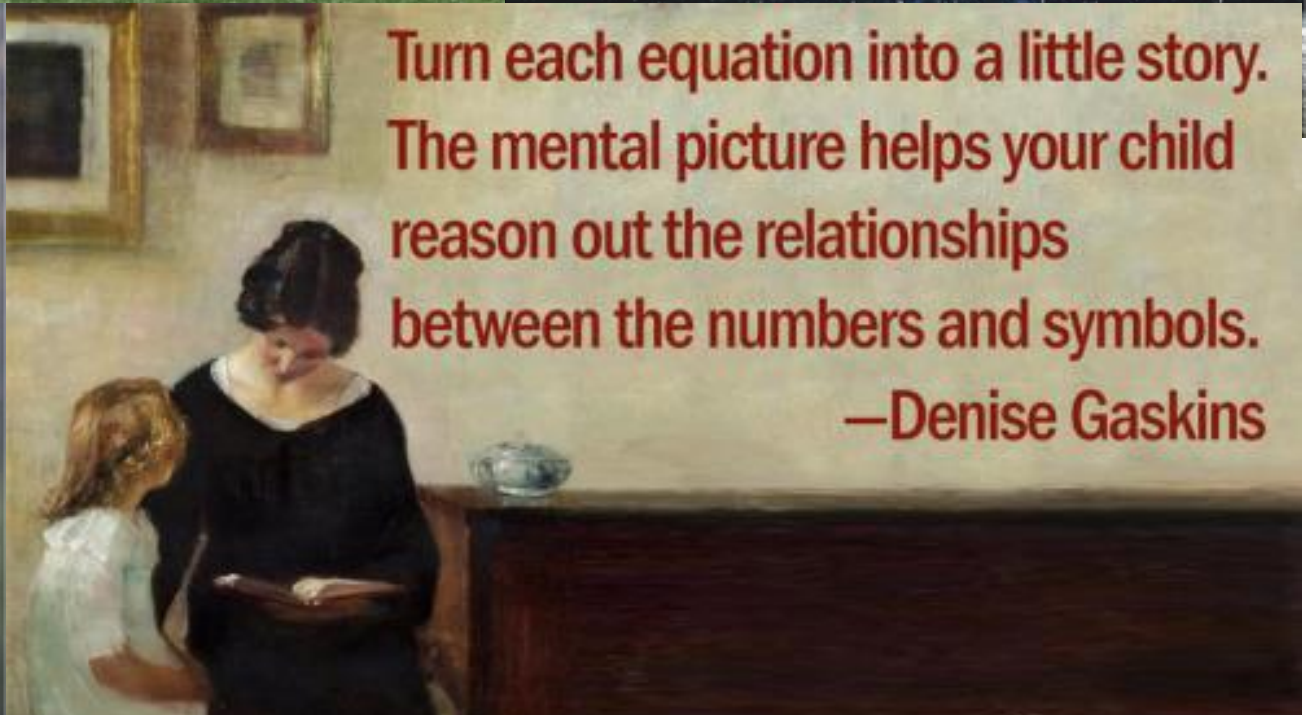

The essence of Math is not to make simple things complicated, but to make complicated things simple
S. Gudder


Just like the games we play, the FUN in learning MATHEMATICS is in the CHALLENGE.
~Erlina Ronda


A good problem should be more than a mere exercise; it should be challenging and not too easily solved by the student, and it should require some "dreaming" time.
~ Howard Eves


What's really neat about MATHEMATICS is that even when there's only one right answer, there's NEVER only ONE RIGHT WAY to do the problem.
~Herb Gross


Turn each equation into a little story. The mental picture helps your child reason out the relationships between the numbers and symbols.
—Denise Gaskins

Pub

Year 1 and 2 Parent Session

Some information….!

Mrs Akhtar

- Teaching for 18 years- taught in 5 schools
and all year groups phases
- It is my 8th year at Newark Hill Academy
- Training to be Mastery Specialist with Maths Hub
- Local Leader in Maths Education- work with other schools.
- Parent at the school!
- Email: shakhtar@newarkhillacademy.org

Outline for the session

- How we teach Mathematics at Newark Hill Academy using the Mastery Approach
- Addition + Practise
- Subtraction + Practise
- Multiplication + Practise
- Division + Practise
- Fluency + Times Table
- Top Tips for Parents to take away

What is Maths?

It is…………….

It is not…………..

Share and swap!

Teaching for Mastery

MathsHUBS

1. We ALL start the journey TOGETHER

2. Some children will need a little additional support along the way

3. Some children, who feel confident, will be let loose. They'll be able to explore deeper into the woods, before returning to the group to continue on with the journey.

4. Children will not be racing off ahead on a different journey.

5. Children will not be left behind alone and isolated.

We're Going on a Maths Hunt

The essence of teaching for Mastery

- It rejects the idea that a large proportion of people “just can’t do Maths”
- All the pupils are encouraged by the belief that by working hard at Maths, they can succeed.
- Pupils are taught through whole class interactive teaching, where the focus is on all the pupils working on the same content at the same time, as happens in Shanghai. This ensures that all can master the concepts, with no-one being left behind.

The essence of teaching for Mastery

- If a pupil fails to grasp a concept or procedure, then this is quickly identified, and early identification ensures the pupil is ready to move forward with the whole class in the next lesson.

- Lesson design identifies the new mathematics that is to be taught, the key points, the difficult points and the carefully sequenced journey through the learning.

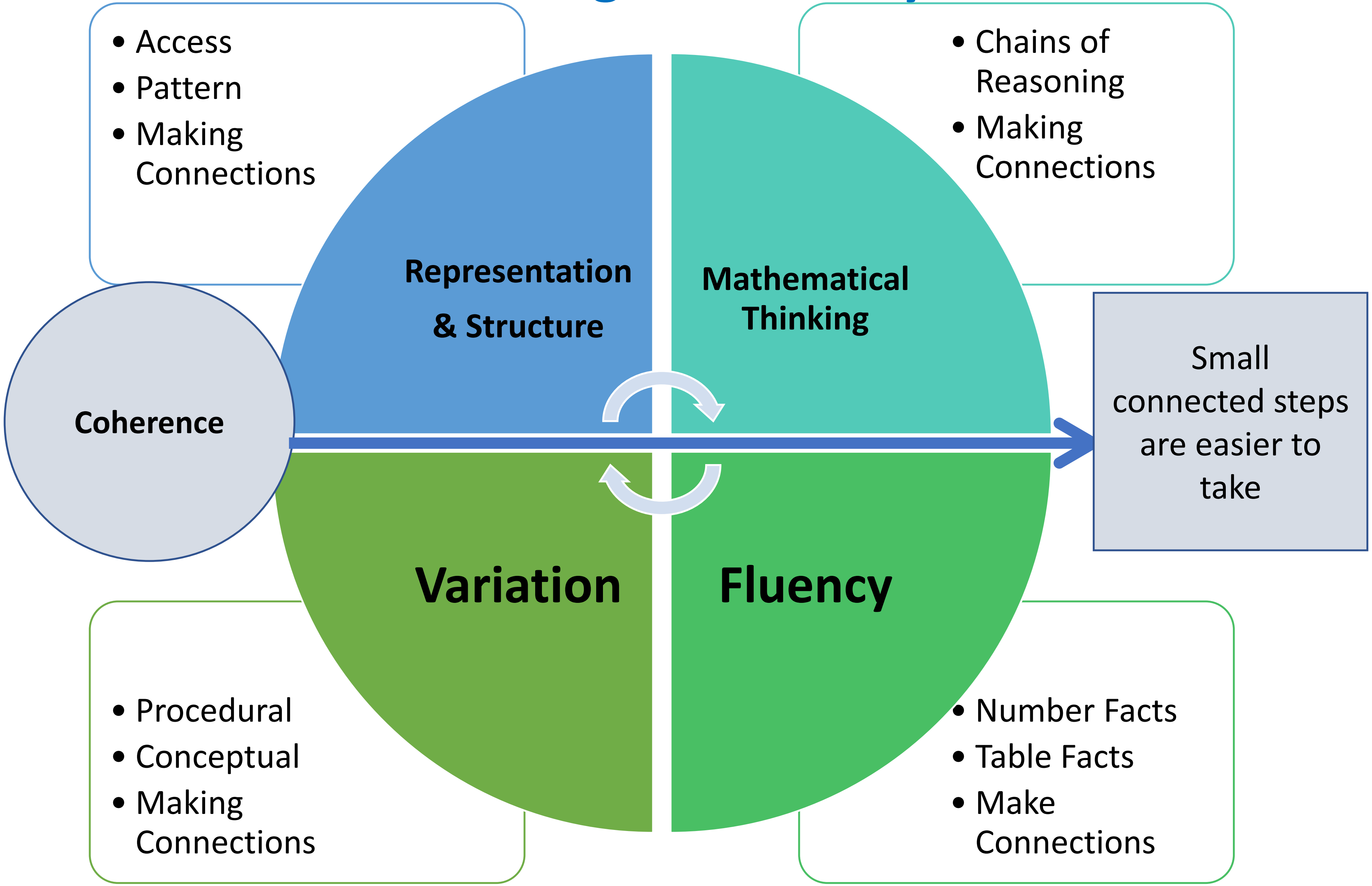
- In a typical lesson the pupils sit facing the teacher, the teacher leads back and forth interaction including questioning, short tasks, explanation, demonstration and discussion.

The essence of teaching for Mastery

- It is recognised that practice forms an important part of learning but the practice used is intelligent practice that reinforces pupils' procedural fluency and develops their conceptual understanding.
- Significant time is spent developing deep knowledge of the key ideas that are needed to underpin future learning. The structure and connections within the mathematics are emphasised, so that pupils develop deep learning that can be sustained.
- Key facts such as tables and number bonds to 10 are learnt to automaticity to avoid cognitive overload in the working memory and enable pupils to focus on new concepts.

Public

Teaching for Mastery



Addition and Subtraction: Structures and Precise Vocabulary.

Addition – progression in written methods Y1 to Y6

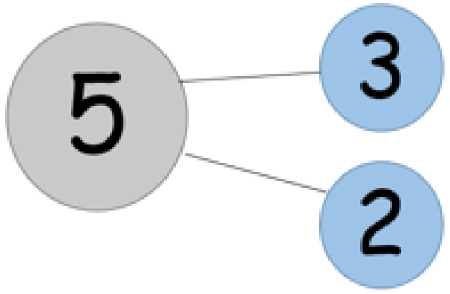
Addition is commutative because the parts can be added in any order.

There are two structures of addition: aggregation and augmentation.

Combining two or more parts to make a whole is called **aggregation.**
Ben had 3 footballs and Zoe had 2 footballs. How many footballs are there altogether?

$$3 + 2 = 5$$

addend   addend   sum



whole   part/part

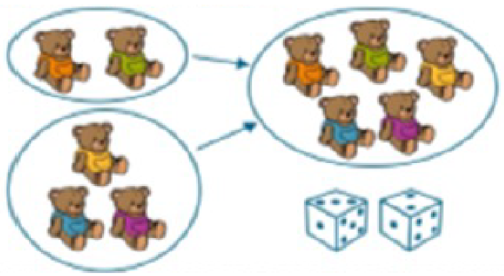
An addition context described by a **first, then, now** story is an example of **augmentation**.
Harry had 3 footballs, then he was given 2 more. How many does he have now?

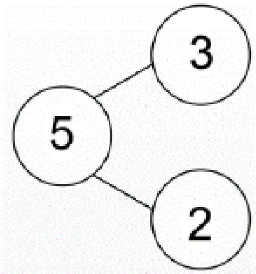
The sum of the parts is equal to the whole.

Both structures can be represented on a part/whole diagram.

Year 1 Addition

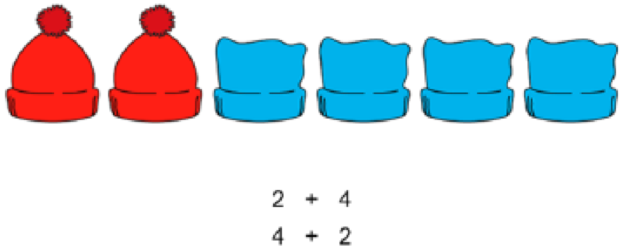
Immerse children in practical opportunities to develop understanding of addition and subtraction. Children will be introduced to the **part, part, whole model.**

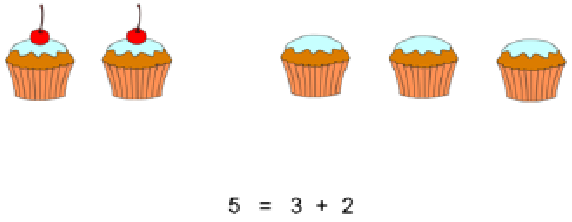




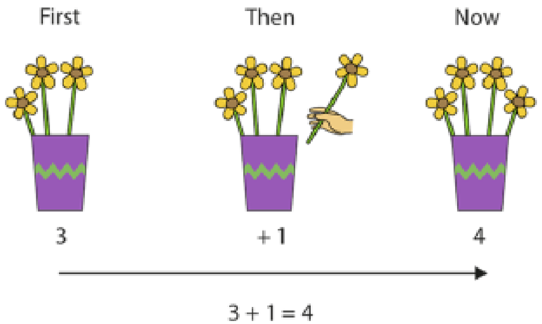
3 bears and 2 bears is 5 bears altogether

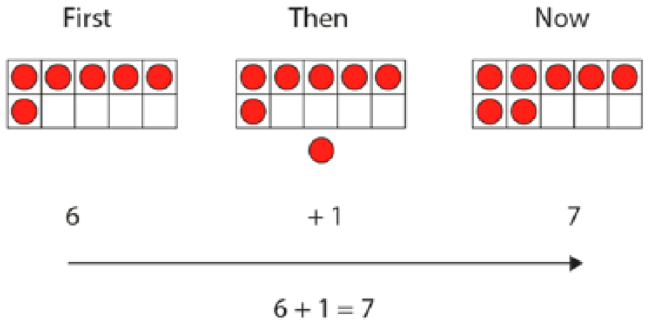
Aggregation structure





Augmentation structure





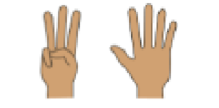


Figure 15: 8 represented as 3 fingers and 5 fingers

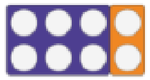


Figure 16: 8 represented as 6 and 2 with base 10 number boards

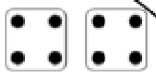


Figure 17: 8 represented as two 4-value dice


Figure 18: 8 represented as 2 rows of 4

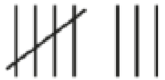


Figure 19: 8 represented as tally marks: 5 and 3

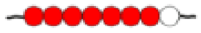


Figure 20: 8 represented on a bead string: 7 and 1

Children should:

- Have access to a wide range of counting equipment, everyday objects, number tracks and number lines, and be shown numbers in different contexts.
- Pupils should also learn that equations can be written in different ways, including:

-varying the position of the equals symbol (for example, 5–2 3 = and 3 5–2 =)

-for addition, the addends can be written in either order and the sum remains the same (commutativity)

- Solve missing box problems, using concrete objects and number line addition to solve them
- Pupils must also learn to relate addition and subtraction contexts and equations to mathematical diagrams such as bar models, number lines, tens frames with counters, and partitioning diagrams.

Language focus

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

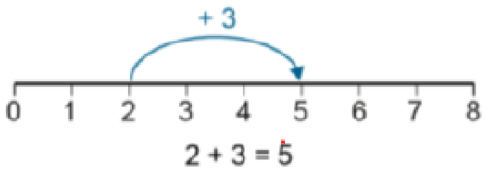


Figure 30: number line and addition equation ($2+3=5$)

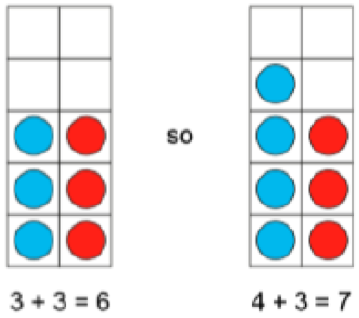


Figure 8: tens frames with counters showing derivation of a 'near-double' addition calculation

Add one-digit and two-digit numbers to 20 including 0

Use numbered number lines to add, by counting on in ones. Encourage children to start with the **larger** number and count on.

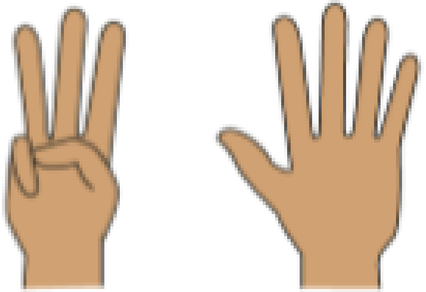


Figure 15: 8 represented as 3 fingers and 5 fingers

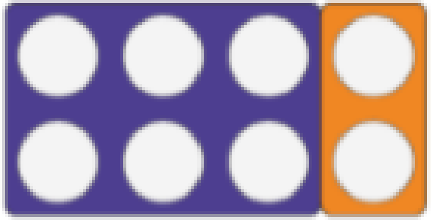


Figure 16: 8 represented as 6 and 2 with base 10 number boards

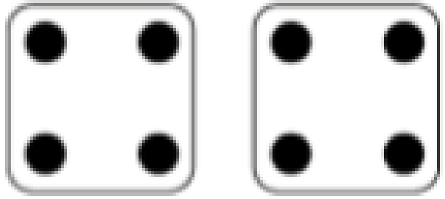


Figure 17: 8 represented as two 4-value dice

Figure 18: 8 represented as 2 rows of 4

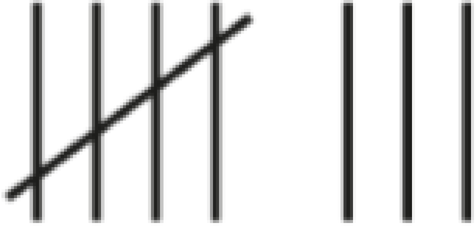


Figure 19: 8 represented as tally marks: 5 and 3

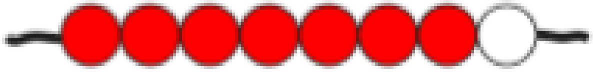


Figure 20: 8 represented on a bead string: 7 and 1

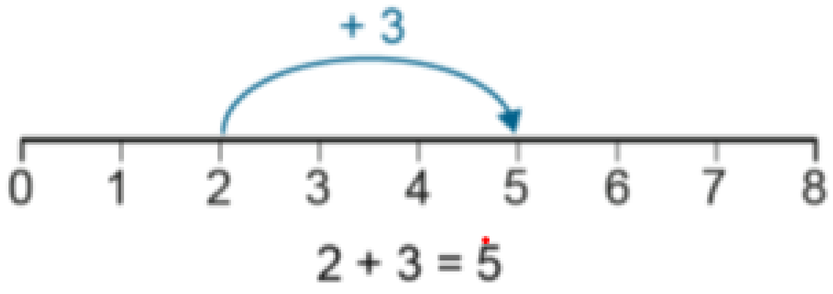


Figure 30: number line and addition equation ($2+3=5$)

Example strategy 1:

> **Language focus**
>
> "I know that double 3 is equal to 6, so 4 plus 3 is equal to 7."

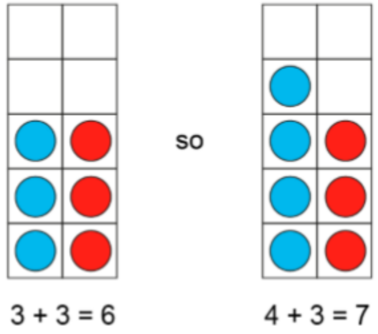


Figure 8: tens frames with counters showing derivation of a 'near-double' addition calculation

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."

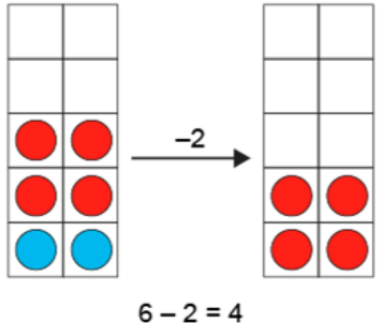
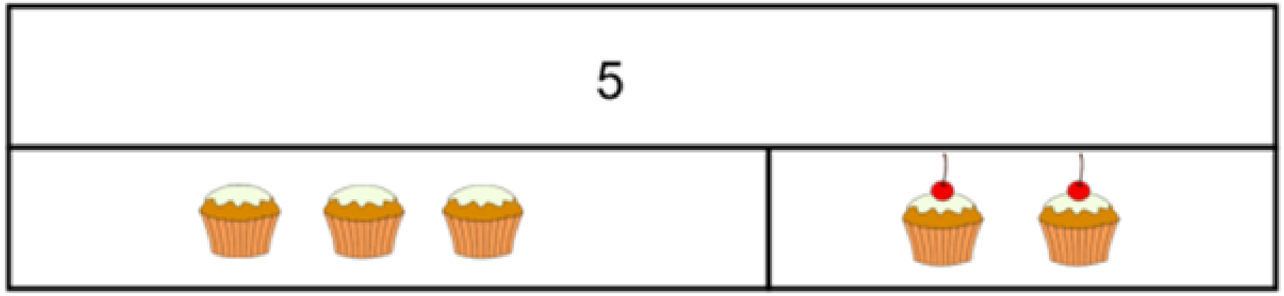


Figure 9: tens frames with counters showing that subtracting 2 from an even number gives the previous even number



+	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										

It is very important for pupils to be able to add and subtract within 10, fluently, by the end of year 1. This should be 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. This is necessary be-fore pupils move on to additive calculation with larger numbers.

The 66 addition facts within 10 are shown on the grid below. The number of addition facts to be learnt is reduced when commutativity is applied and 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.

Number pairs within 5

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

Adding 0 to a number

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

Add one to a number

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

Doubles

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

5 and a bit

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

Public

Number pairs of 10

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

The remaining facts (in white) are trickier to learn but are covered in Year 2.

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

Year 2 Addition

Add across 10

Pupils need to have a strategy for confidently and fluently carrying out calculations such as: 7+ 5 = 12 For both addition across 10, tens frames and partitioning diagrams can be used to support pupils as they learn about these strategies.

First, pupils should learn to add three one-digit numbers by making 10, for example,

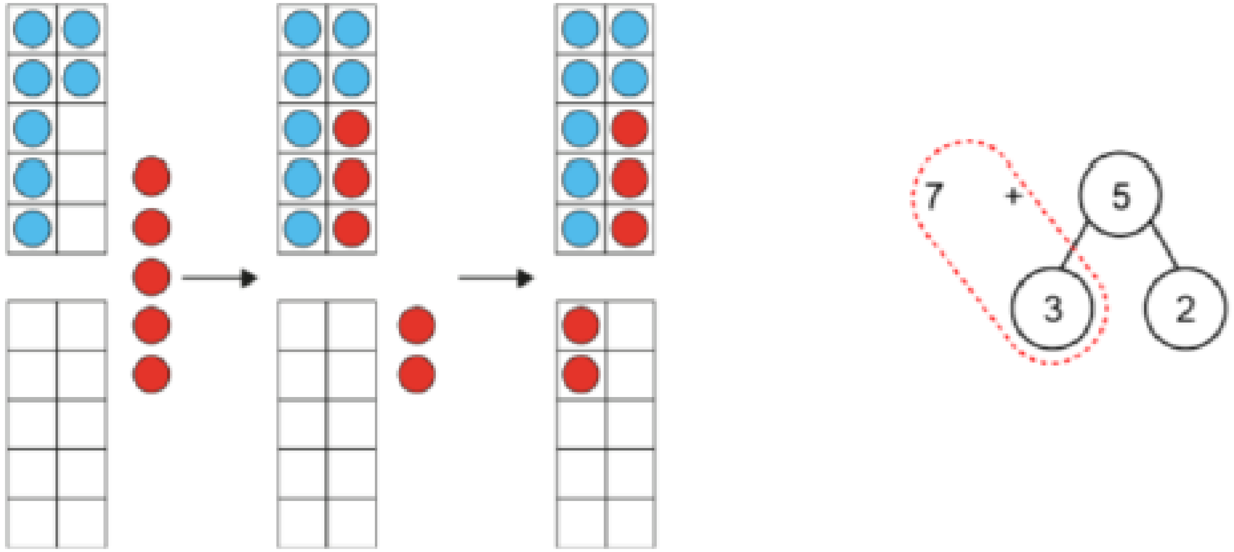
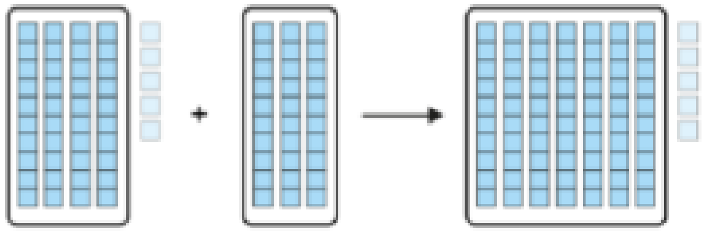


Figure 5: tens frames with counters, and a partitioning diagram, showing $7 + 5 = 12$

7 +3 +2 = 10 + 2. They can then relate this to addition of two numbers across 10, by partitioning one of the addends, for example 7 + 5 = 7 + 3 + 2

1) Add within 100 (2 multiples of ten , ones to/from a two-digit number and multiples of ten to/from a two-digit number)

Tens frames, Dienes and partitioning diagrams can be used to support pupils as they learn how to relate these calculations to one-digit calculations. Throughout, pupils should use spoken language to demonstrate their reasoning.



	4	+	3	=	7
so	40	+	30	=	70
	45	+	30	=	75

Figure 9: Dienes and equations to support adding a multiple of 10 to a two-digit number

<u>Language focus</u> "4 plus 3 is equal to 7. So 4 tens and plus 3 tens is equal to 7 tens."

2) Add within 100 (any 2 two-digit numbers)

To add 2 two-digit numbers, pupils need to combine one-digit addition facts with their understanding of two-digit place value. Pupils should first learn to add 2 multiples of ten and 2 ones before moving on to the addition of 2 two-digit numbers, for example:

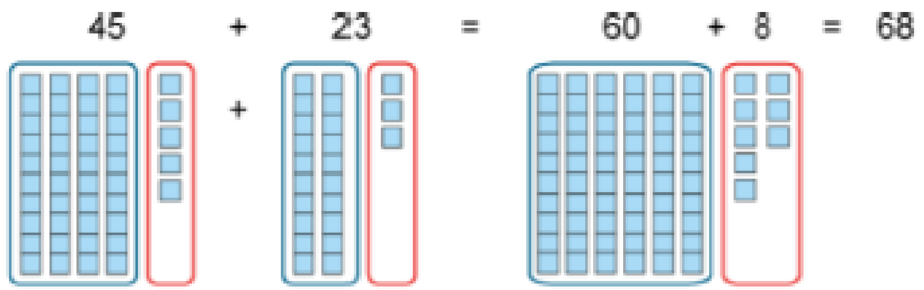


Figure 11: Dienes and an equation to support adding 2 two-digit numbers

- $40+20+5+3=60+8=68$
- $40+5+20+3=60+8=68$
- $45+23=60+8=68$

<u>Language focus</u> "First I partition both numbers. Then I add the tens. Then I add the ones. Then I combine all of the tens and all of the ones."

Pupils can then learn to be more efficient, by partitioning just one addend, for example:

$$
\begin{aligned}
45+23 &= 45+20+3 \\
&= 65+3
\end{aligned}
$$

26 + 37 = 63 26 → 20, 6; 37 → 30, 7 20 + 30 = 50 6 + 7 = 13 50 + 13 = 63	26 + 37 = 63 37 → 30, 7 26 + 30 = 56 56 + 7 = 63
Figure 17: adding 26 and 37 by partitioning both addends	**Figure 18: adding 26 and 37 by partitioning one addend**

Pupils do not need to learn formal written methods for addition in Year 2, but column addition could be used as an alternative way to record two-digit calculations at this stage.

**Pupils do not need to learn formal writ-
ten methods for addition in Year 2,** but column addition could be used as an alternative way to record two-digit calculations at this stage.

For calculations such as 26 + 37, pupils can begin to think about the 2 quantities arranged in columns under place-value headings of tens and ones.

They can use counters, dienes or draw dots for support .

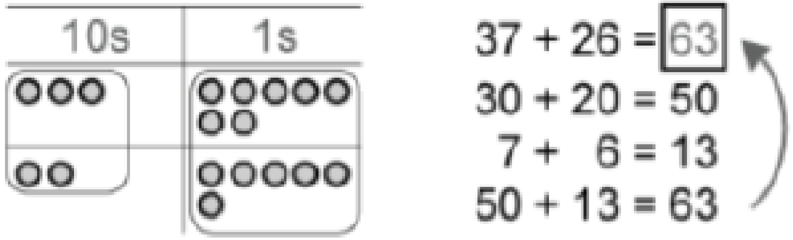
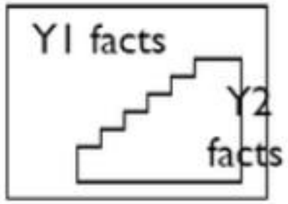


Figure 21: adding 2 two-digit numbers using 10s and 1s columns

- Adding 1
- Bonds to 10
- Adding 10
- Bridging/ compensating
- Adding 2
- Adding 0
- Doubles
- Near doubles



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

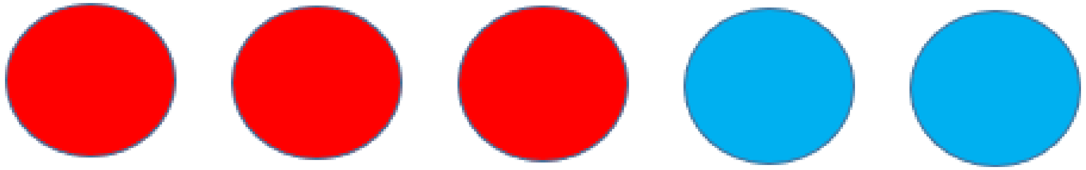
Let’s Practise!

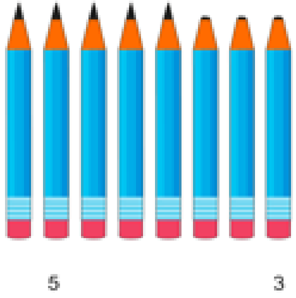
Subtraction – progression in written methods Y1 to Y6

$8 - 1 = 7$

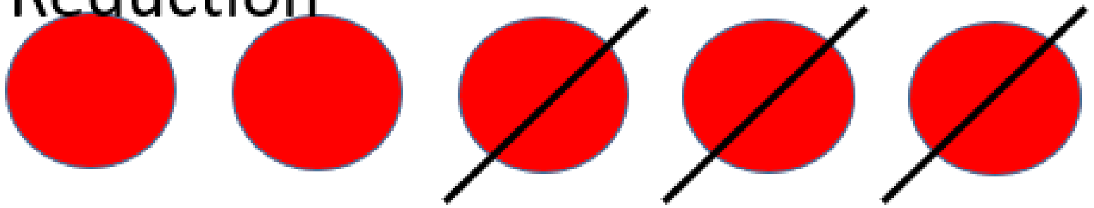
minuend subtrahend difference

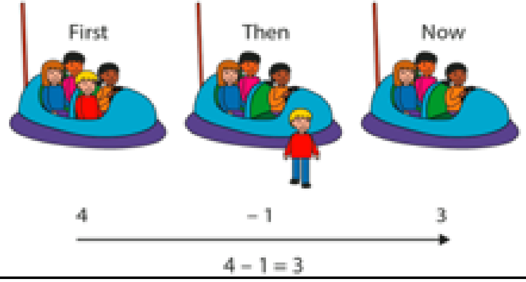
Partitioning – the 'not' structure



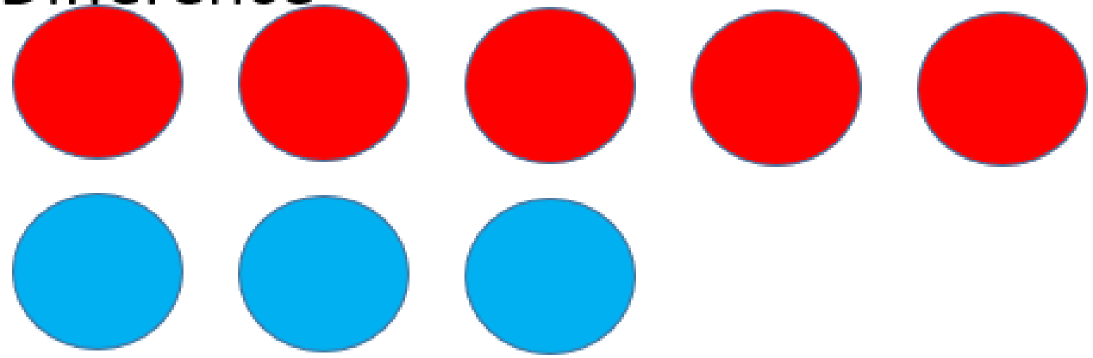


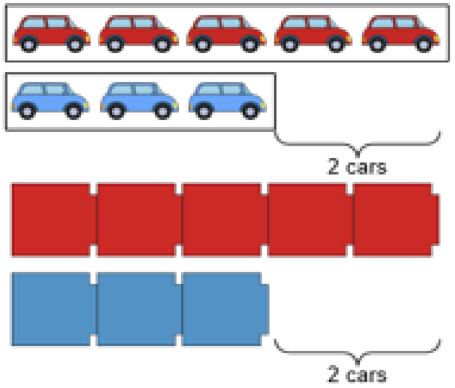
Reduction





Difference



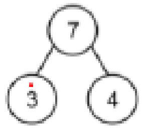


Year 1 Subtraction

Subtract from numbers up to 20

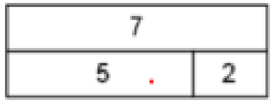
Pupils should learn to compose and partition numbers within 10 before moving on to formal addition and subtraction. **Start with expressions (no = sign) before moving onto equations that have an = sign.**

Children use a variety of model to represent subtraction including part, part, whole as well as bar model.



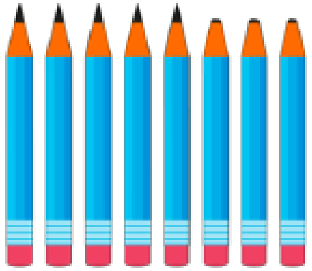
7 – 3 = 4

Figure 32: cherry partitioning model and subtraction equation (7 – 3 = 4)



7 – 2 = 5

Figure 29: bar model and subtraction equation (7 – 2 = 5)



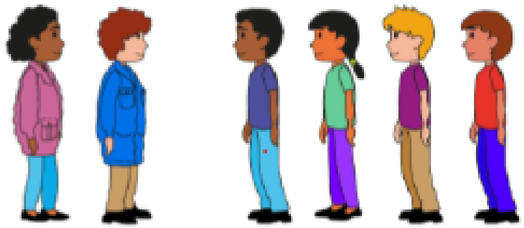
8 - 3

Partitioning

Pupils must understand that, in partitioning situations, the subtraction symbol represents a splitting up or differentiating of the whole.

The problem “There are 6 children altogether. 2 children are wearing coats. How many are not wearing coats?” is represented by 6–2 4 = . Here, the subtraction symbol represents the separation of the 2 children wearing coats, and so, the number of children not wearing coats is exposed.

How many children are not wearing coats?

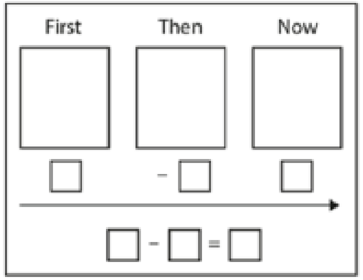


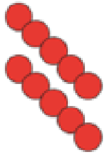
6 – 2 = 4

Figure 25: subtraction as partitioning

Reduction

Pupils must also be able to write and interpret expressions and equations to represent reduction (decreasing a quantity by taking some away). Note that 'take away' should only be used to describe the subtraction operation in reduction contexts.





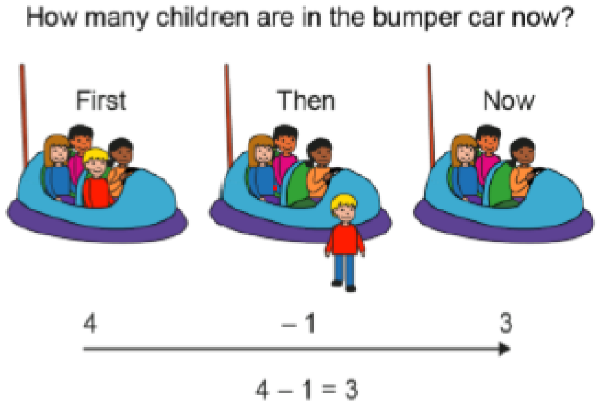
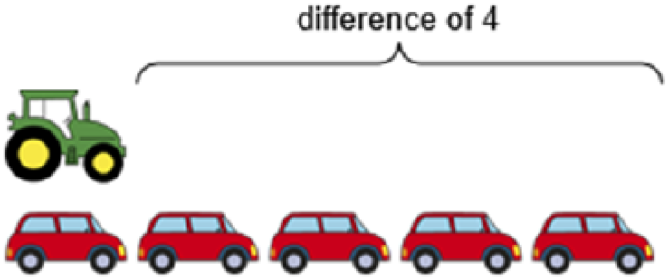
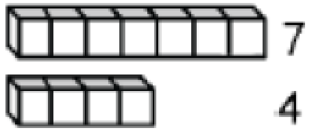


Figure 27: subtraction as reduction

Difference





Children use number sense when solving problems.

Language focus

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

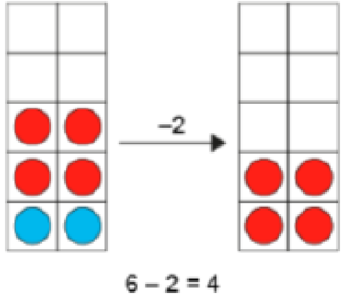


Figure 9: tens frames with counters showing that subtracting 2 from an even number gives the previous even number

Year 2 Subtraction

Pupils should practise additive calculation within 10 until they have automatic recall of the additive facts. Fluency in these facts is required for pupils to succeed with addition and subtraction across 10 (and for additive calculation with larger numbers). (66 +/- Facts on Page 3)

Subtract across 10

Use the 'subtracting through 10' strategy (partitioning the subtrahend) – part of the subtrahend is subtracted to reach 10, then the rest of the subtrahend is subtracted from 10

OR

the 'subtracting from 10' strategy (partitioning the minuend) – the subtrahend is subtracted from 10, then the difference between the minuend and 10 is added.

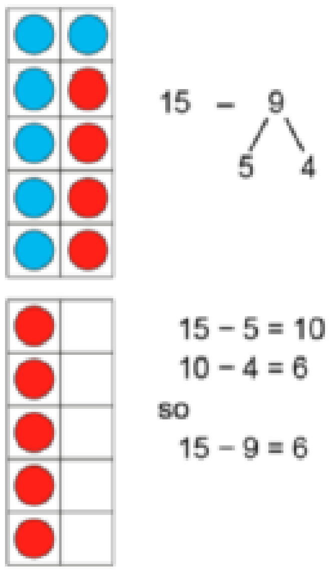


Figure 6: using the 'subtracting through 10' strategy to calculate 15 minus 9

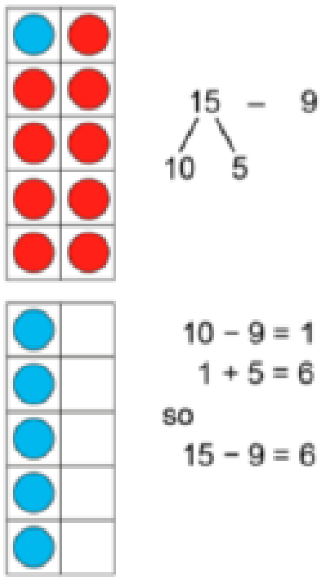


Figure 7: using the 'subtracting from 10' strategy to calculate 15 minus 9

Finding the difference- pupils should recognise problems with difference and relate them to subtraction

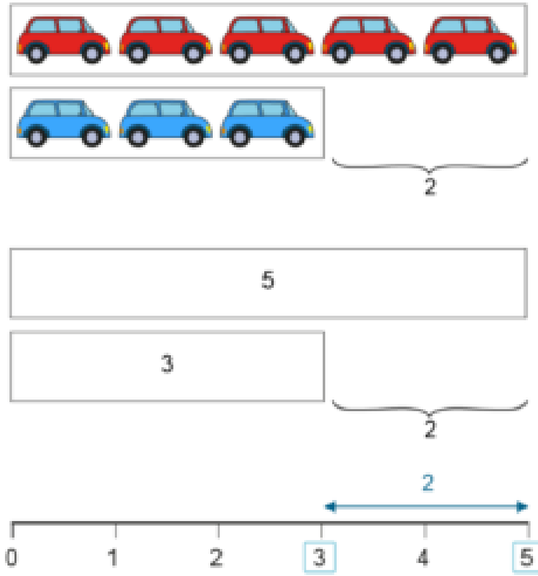


Figure 8: finding the difference – bar model and number line

There are 5 red cars and 3 blue cars. What is the difference between the number of red cars and blue cars?

Pupils should be able to recognise contextual problems involving finding a difference, phrased as 'find the difference', 'how many more' and 'how many fewer'. Pupils may solve these problems by relating them to either a missing addend equation or to subtraction, applying known facts and strategies.

Estimate

Calculate

Check it!

1) Subtract within 100 (2 multiples of ten , ones to/from a two-digit number and multiples of ten to/from a two-digit number)

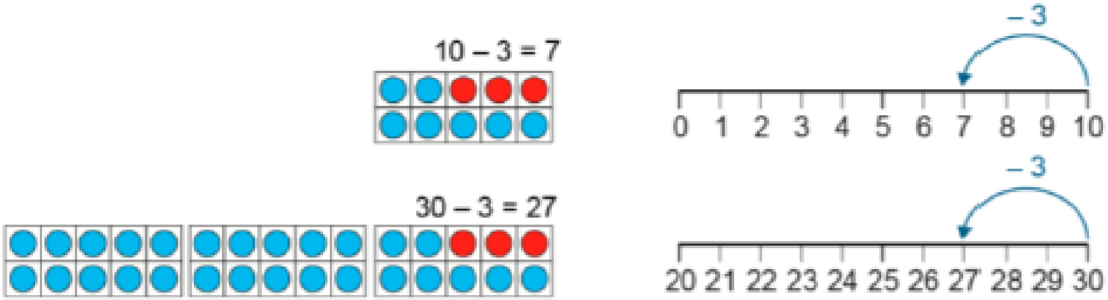


Figure 10: tens frames with counters, and number lines, to support subtracting ones from a multiple of 10

Tens frames, Dienes and partitioning diagrams can be used to support pupils as they learn how to relate these calculations to one-digit calculations.

<u>Language focus:</u>

"10 minus 3 is equal to 7. So 30 minus 3 is equal to 27."

$45 - 20 - 3 = 25 - 3$

$45 - 3 - 20 = 42 - 20$

2) Add and subtract within 100 (any 2 two-digit numbers).

When pupils learn to subtract one two-digit number from another, the progression is similar to that for addition. Pupils can first learn to subtract a multiple of ten and some ones from a two-digit number, and then connect this to the subtraction of one two-digit number from another, for example:

$63 - 17 = 46$ $10 \quad 7$ $63 - 10 = 53$ $53 - 7 = 46$	$63 - 17 = 46$ $10 \quad 7$ $63 - 7 = 56$ $56 - 10 = 46$
Figure 19: subtracting 17 from 63 by subtracting the tens first	**Figure 20: subtracting 17 from 63 by subtracting the ones first**

There is an important difference compared to the addition strategy: pupils should not partition both two-digit numbers for subtraction as this can lead to errors, or calculations involving negative numbers, when bridging a multiple of 10, for example:

Subtraction facts to 10

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

Let’s Practise!

Public

Multiplication and Division

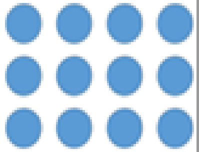
Structures and Use of Precise Language

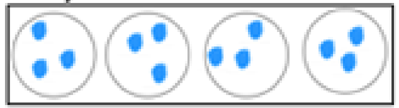
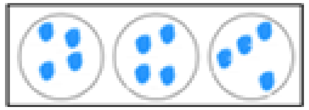
MULTIPLICATION KEY TEACHING POINTS

3 x 4 Is this 3 groups of 4 or 4 groups of 3?

At Newark Hill Academy we say: without a picture or a context to tell us which is the multiplicand and which is the multiplier, it can be either.
(N.B. White Rose follow the Shanghai way of working which only allows the multiplier first, so this would be 3 groups of 4; NCETM encourages children to see this both ways so is in line with our policy.)

Start by representing this with an array so that children can see both 3 lots of 4 and 4 lots of 3.

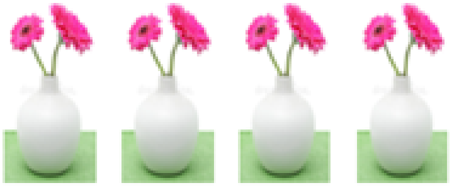


Also represent as repeated groups  and 

The Language of Multiplication

factor x factor = product A factor is a whole number, so this wouldn't be appropriate language when multiplying decimals

multiplicand x multiplier = product When we have a picture or a context, we can tell which number is the multiplier and which number is the multiplicand.



Multiplicand is **2**	Multiplier is **4**

The **2** represents the number of flowers, the **4** represents the number of vases.

Year 1 Multiplication

Immerse children in practical opportunities to develop understanding of multiplication and division.

Counting in steps ('skip' counting)

Count in 2s

Count in 10s and 5s

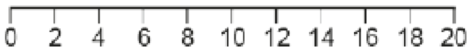


Figure 10: number line to support counting in multiples of 2

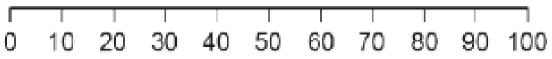


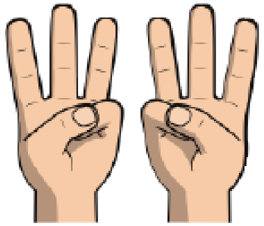
Figure 11: number line to support counting in multiples of 10

Figure 12: number line to support counting in multiples of 5

Key skills:
Explore equal and unequal groups
Skip count in 2s, 5s and 10s.
Recognise the structure of multiplication as repeated addition

Doubling and halving

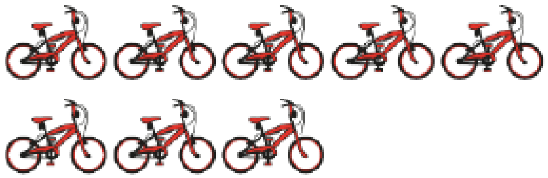
Find doubles to double 5 using fingers



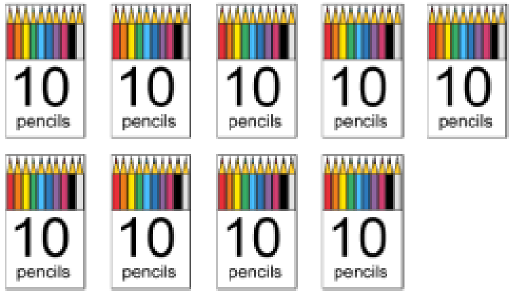
1	2	3	4	5	6	7	8	9	[illegible]
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Multiply with concrete objects, arrays and pictorial representations.

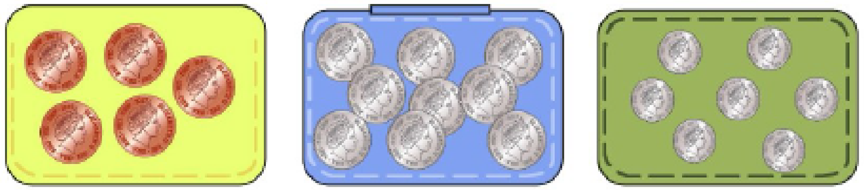
How many wheels are there altogether? Count in groups of 2.



How many pencils are there?



How much money is in each purse?

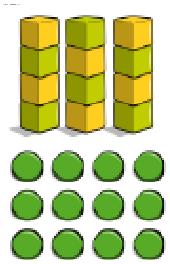


2p coins 10p coins 5p coins

Grouping

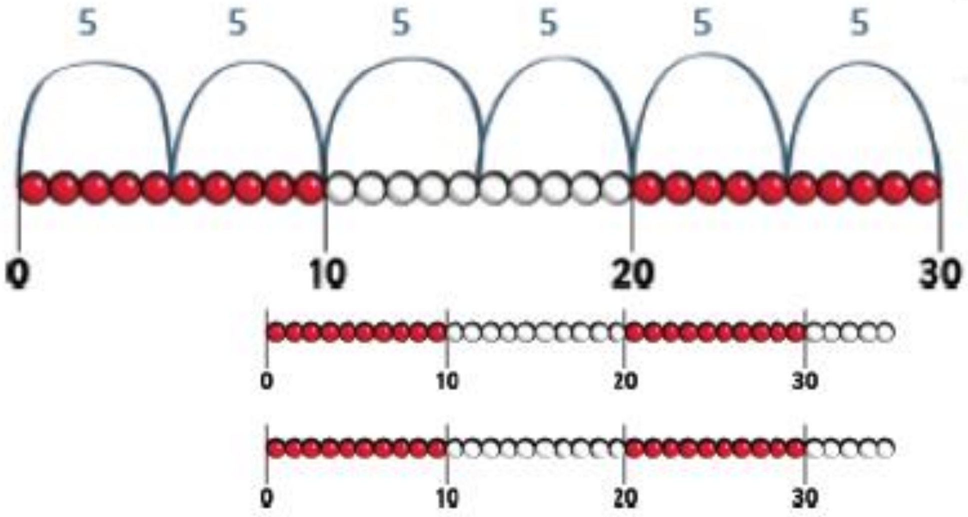
Begin to use visual and concrete arrays and sets of objects to find the answer to ‘three groups of four’ or ‘ two groups of five’ etc

Three groups of four



Pupils should also practise counting in two ways: counting the total number of objects using skip counting, or counting the number of repeated groups. This will prepare pupils for multiplication and division in year 2.

Year 2 Multiplication

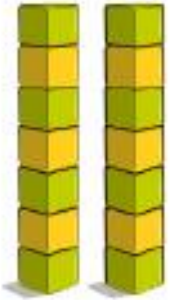


Counting in steps ('skip' counting)

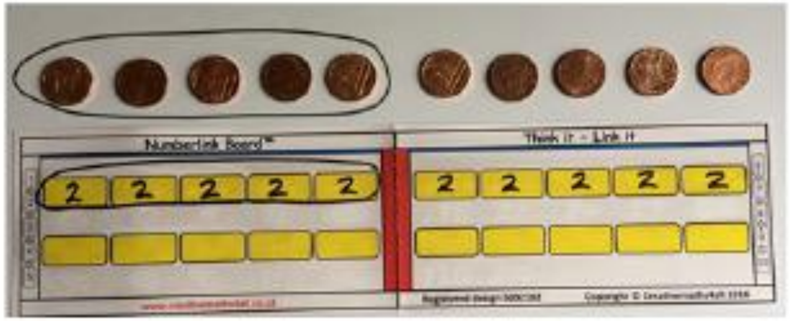
Count in 2s, 5s, 10s

Doubling

Know doubles to double 20



Show me five lots of 2



Begin to know doubles of multiples of 5 to 100 E.g. double 35 is 70

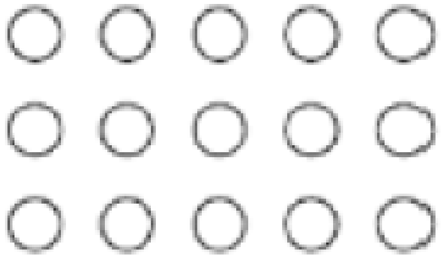
Begin to double 2-digits numbers less than 50 with 1s digits of 1, 2, 3, 4, or 5

Multiply using arrays and repeated addition (using at least 2s, 5s and 10s)

Use arrays:

Relate to

'skip' counting



5 x 3 = 15

5 x 3 = 3 + 3 + 3 + 3 + 3 = 15

3 x 5= 5 + 5 + 5 = 15

3 x 5 = 15

Use arrays to help teach children to understand the commutative law of multiplication and give examples such as 3 x _ = 6

Pupils must first be able to recognise equal groups. To better understand and identify equal groups, pupils should initially explore both equal and unequal groups. Pupils should then learn to describe equal groups with words.

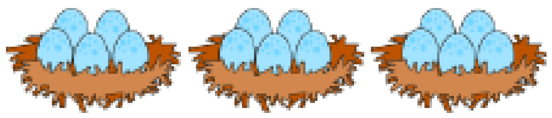


Figure 12: recognising equal groups – 3 groups of 5 eggs

Language focus

"There are 3 equal groups of eggs."

"There are 5 eggs in each group."

"There are 3 groups of 5."

Language focus

"The 3 represents the number of groups."

"The 5 represents the number of eggs in each group."

"The 15 represents the total number of eggs."

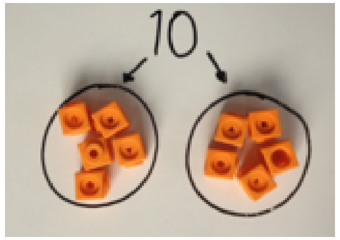
Let’s Practise!

Structure and Language of Division

Division has two different structures that are explored separately.

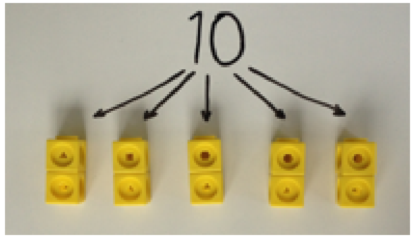
Division as grouping (quotitive) :

10 objects put in groups of 5



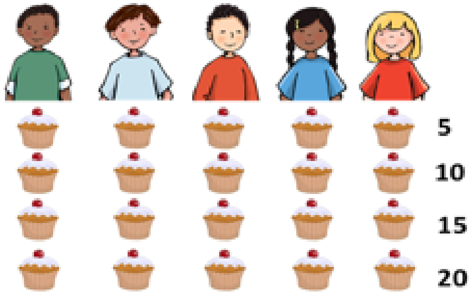
Division as sharing (partitive):

10 objects shared into 5 groups



How many 5s are there in 10?
The 5s are either kept together (quotitive) or the 5s are distributed (partitive).

I have 20 cakes and I share them equally between five people. How many cakes will they each get?



£480 ÷ 8 = £60

DIVIDEND
DIVISOR
QUOTIENT

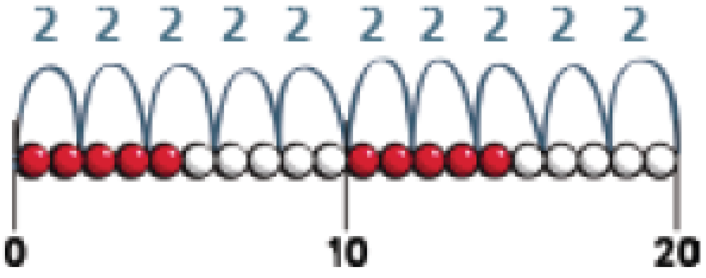
There are 15 biscuits and I put them into bags of five. How many bags do I need?

Year 1 Division

Immerse children in practical opportunities to develop understanding of multiplication and division.

Counting in steps ('clever' counting)

Count in 2s

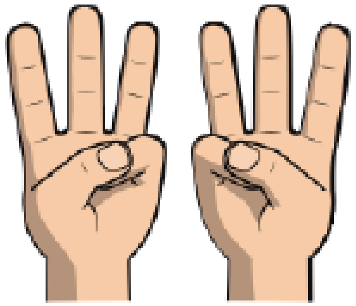


Count in 10s and 5s

1	2	3	4	5	6	7	8	9	
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Doubling and halving

Find doubles to double 5 using fingers

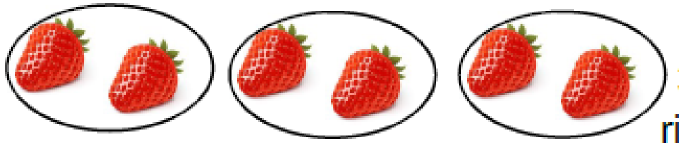


Group and share small quantities

Using objects, diagrams and pictorial representations to solve problems involving both **grouping** and **sharing.**

Grouping:

There are 6 strawberries, how many people can have 2 strawberries each?

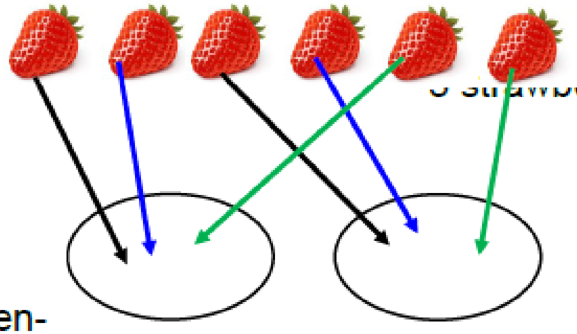


3 people

ries

Sharing:

There are 6 strawberries shared between 2 people, how many do they each get?



Children should :

- use lots of practical apparatus, arrays and picture representations
- Be taught to understand the difference between **'grouping'** objects (How many groups of 2 can you make?) and **'sharing'** (Share these sweets between 2 people)
- Be able to count in multiples of 2s, 5s and 10s.
- Find **half** of a group of objects by sharing into 2 equal groups.

Example division problem in a familiar context:

There are 5 children on this table and there are 15 pieces of fruit to share between them. If we share them equally, how many will we each get?

Can they work it out and give a division statement… ?

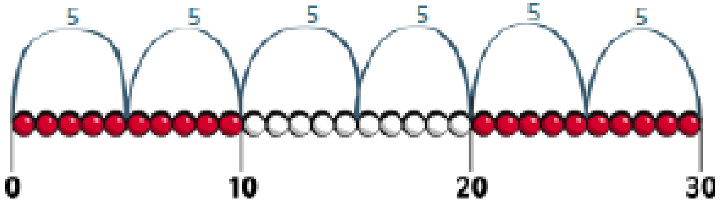
"15 shared between 5 people gives you 3 each."

Year 2 Division

Group and share using the ÷ and = sign. Show that division is not commutative.

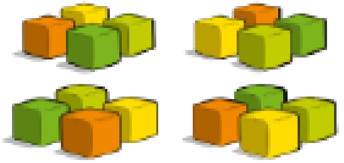
Counting in steps ('skip' counting)

Count in 2s, 10s and 5s. Begin to count in3s



Sharing

Begin to find half or a quarter of a quantity using sharing e.g. find a quarter of 16 cubes by sharing the cubes into four piles.

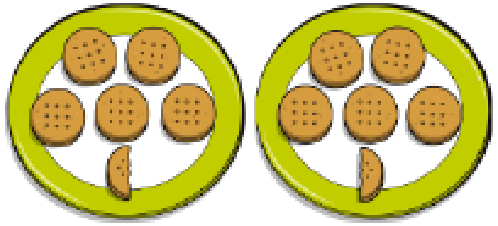


Find 1/4, 1/2, 3/4 of small quantities

Halving

Find half of numbers up to 40, including realising that half of an odd number gives a remainder of 1 or answer containing a ½ e.g. ½ of 11 = 5 ½

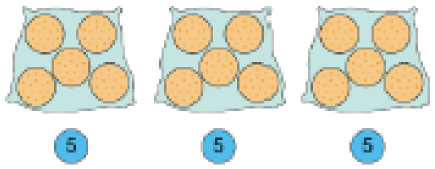
Begin to know half of multiples of 10 to 100



Grouping

Relate grouping problems where the number of groups is unknown to multiplication equation with a missing factor and to division equations (quotative division).

$\square \times 5 = 15$



Written methods

Group and share

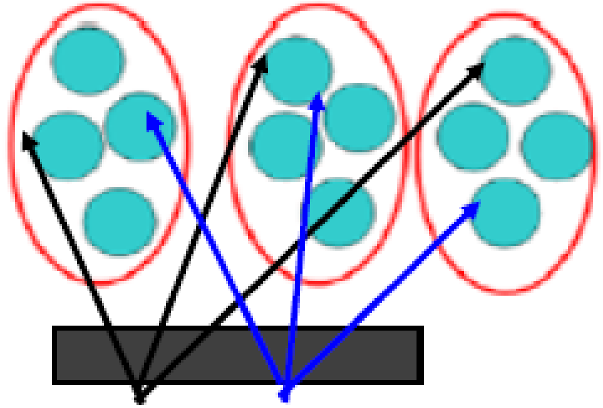
Using objects, diagrams and pictorial representations and grouping on a number line.
For grouping and sharing contexts, move to a common language for division: “How many …..s in …….?”

How many groups of 4 can be made with 12 stars?

Grouping:

4 4 4

12 sweets shared between 3 people



Use grouping (quotitive) and sharing (partitive) contexts as shown below.

Mo is putting 6 flowers into pots.

He puts 2 flowers into each pot.

How many pots does he need?

I have 12 pennies and I divide them between 3 children.
How many 3s are there in 12?

Dora has 10 sweets.

She shares them equally between 2 plates.

How many sweets are on each plate?

6 ÷ 2 = 3
What does each number represent?

12 ÷ 3 = 4
What does each number represent?

10 ÷ 2 = 5
What does each number represent?

Let’s Practise!

It is useful for pupils to learn the multiplication tables in the following order/groups:

1. 10 then 5 multiplication tables

1. 2, 4 and 8 multiplication tables one after the other

2. 3, 6, and 9 multiplication tables one after the other

3. 7 multiplication table

4. 11 and 12 muliplication tables

The connections and patterns will help pupils to develop fluency and understanding.

The national curriculum requires pupils to recall multiplication table facts up to 12×12, and this is assessed in the multiplication tables check. For pupils who do not have automatic recall of all of the facts by the time of the check, fluency in facts up to 9×9 should be prioritised in the remaining part of year 4. The facts to 9×9 are particularly important for progression to year 5, because they are required for formal written multiplication and division.

The 36 multiplication facts that are required for formal written multiplication are as follows.

2×2 3×2 4×2 5×2 6×2 7×2 8×2 9×2	3×3 4×3 5×3 6×3 7×3 8×3 9×3	4×4 5×4 6×4 7×4 8×4 9×4	5×5 6×5 7×5 8×5 9×5	6×6 7×6 8×6 9×6	7×7 8×7 9×7	8×8 9×8	9×9

How can you help at home?

1

Be positive about maths. Try not to say things like "I can't do maths" or "I hated maths at school" – your child may start to think like that themselves.

2

Point out the maths in everyday life. Include your child in activities involving numbers and measuring, such as shopping, cooking and travelling.

3

Praise your child for effort rather than for being "clever". This shows them that by working hard, they can always improve.

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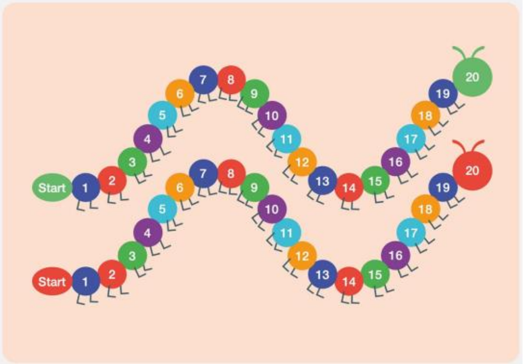
Younger children will likely benefit from activities, games, and discussion with parents.

Working with younger children at home, it is important not to see mathematics as a separate or standalone activity but rather as something which can be incorporated into everyday activities, games, stories, and conversations.



Here are some ways that we can support parents to celebrate maths as part of their day:

•Board games, particularly ones with linear, numbered, equal-sized spaces can be useful for the development of early number skills. Most families will have ‘Snakes and Ladders’ or something similar; if not, this is a great opportunity to make your own. Incorporate mathematics into everyday routines and activities: tidying up and meal times in particular provide opportunities for conversations about counting, comparing, time, and sharing.

•Snack times and meals are a great opportunity to learn mathematics, such as counting, estimating and comparing. For example, with young children, you could count and match items in a 'Teddy Bears' Picnic.' You can compare quantities such as more or less or quantify food items (making sure to link the last number counted to the number of items in the set) or discuss the capacity of different cups or jugs. A parent or puppet can make deliberate errors in counting and sharing, with the child encouraged to identify these mistakes.

•Use mathematical vocabulary where possible as part of conversations and play: for example, when making comparisons (which is bigger? which teddy is first in line? who has more? are they shared fairly?). Opportunities can also be taken for 'shape-spotting' and sorting around the home.

- Finding the mathematics in story books. www.mathsthroughstories.org contains explicit links to mathematics in stories, but you can also consider opportunities in more common story books for mathematical discussion.

- Use manipulatives to support learning. For example, building bricks could be used to model simple addition and multiplication, or toys used to make comparisons of size or quantity. Measuring items, scales, construction materials, puzzles, sorting and pattern materials are also great sources for discussion!