EYFS and KS1 Maths Meeting for Parents

10th February 2022

Mrs Phipps and Mrs Collins

Aims of tonight's meeting…

- To share with parents the school's calculation policy
- To share with parents the strategies and methods employed at school so that they are mirrored at home.
- To give parents the knowledge and skill to develop their children's understanding of calculation methods.
- To highlight to parents other areas that would lead to a mastery of calculation for your child.
- To get you all to download an excellent free app…

End of year expectations for calculations.

EYFS	Year 1	Year 2
Children at the expected level of development will: • **Have a deep understanding of number to 10, including the composition of each number;** • **Subitise (recognise quantities without counting) up to 5;** • **Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.** • Verbally count beyond 20, recognising the pattern of the counting system; • Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity; • Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.	• read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs • represent and use number bonds and related subtraction facts within 20 • add and subtract one-digit and two-digit numbers to 20, including zero • solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ? – 9. • solve one-step problems involving multiplication and division, by calculating the answer using concrete objects • solve one-step problems involving multiplication and division using pictorial representations and arrays with the support of the teacher	• solve problems with addition and subtraction: • using concrete objects and pictorial representations, including those involving numbers, quantities and measures • applying their increasing knowledge of mental and written methods • recall and use addition and subtraction facts to 20 fluently • derive and use related facts up to 100 • add and subtract numbers using concrete objects, pictorial representations, and mentally, including: • a two-digit number and ones • a two-digit number and tens • two two-digit numbers • adding three one-digit numbers • show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot • recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems • recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers • calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs • show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot • solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts

This is the new EYFS curriculum since 2021

Power Maths, Mastery and Mindsets…

- DfE approved Mastery programme developed with the White Rose Maths Hub – the largest in the UK.
- *Power Maths* and mastery methods focus on the distinction between 'fixed' and 'growth' mindsets (Dweck, 2007). Those with a fixed mindset believe that their basic qualities (for example, intelligence, talent and ability to learn) are pre-wired or fixed: 'If you have a talent for maths, you will succeed at it. If not, too bad!' By contrast, those with a growth mindset believe that hard work, effort and commitment drive success and that 'smart' is not something you are or are not, but something you become. In short, everyone can do maths!

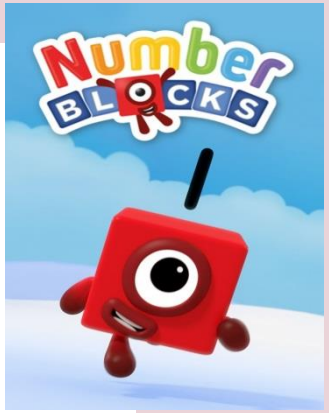
Concrete, Pictorial and Abstract (CPA)

- Strategies are set out in a Concrete, Pictorial, Abstract (CPA) approach to develop children's deep understanding and mastery of mathematical concepts. Children use concrete objects to help them make sense of the concept or problem; this could be anything from real or plastic fruit, to straws, counters or cubes.
- This is then developed through the use of images, models and children's own pictorial representations before moving on to the abstract mathematics.
- Children will travel along this continuum again and again, often revisiting previous stages when a concept is extended. It is also worth noting that if a child has moved on from the concrete to the pictorial, it does not mean that the concrete cannot be used alongside the pictorial. Or if a child is working in the abstract, ‘proving’ something or ‘working out’ could involve use of the concrete or pictorial.

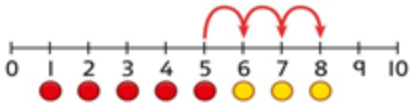
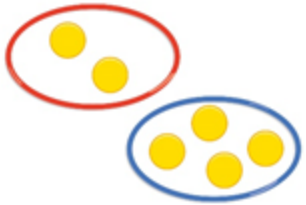
Mastery in Reception

- We are currently working with the NCETM and the Maths Hub to deliver a Mastery curriculum across Rec and KS1 which is focuses on building strong foundations in Number fluency.
- This is focussed on subitising initially (counting eyes) then known facts and bonds within numbers.
- We use Number blocks and a practical Mastery approach to ensure a depth of understanding about numbers.
- Addition skills begin with language – fewer or more, comparisons and number stories, after building a firm visual representation of bonds.
- Adults support children in recording their addition sums in the written form on whiteboards and in their maths books.
- Let's download the 'White Rose Maths app'….





Addition in Year 1

	Concrete	Pictorial	Abstract
Year 1 Addition	**Counting and adding more** Children add one more person or object to a group to find one more.	**Counting and adding more** Children add one more cube or counter to a group to represent one more.  *One more than 4 is 5.*	**Counting and adding more** Use a number line to understand how to link counting on with finding one more.  *One more than 6 is 7.* *7 is one more than 6.* Learn to link counting on with adding more than one.  *5 + 3 = 8*
	Understanding part-part-whole relationship Sort people and objects into parts and understand the relationship with the whole.  *The parts are 2 and 4. The whole is 6.*	**Understanding part-part-whole relationship** Children draw to represent the parts and understand the relationship with the whole.  *The parts are 1 and 5. The whole is 6.*	**Understanding part-part-whole relationship** Use a part-whole model to represent the numbers.  6 + 4 = 10 *6 + 4 = 10*

Addition in Year 1 (cont)

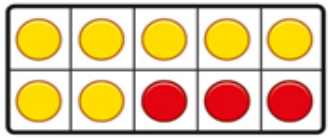
Knowing and finding number bonds within 10
Break apart a group and put back together to find and form number bonds.

3 + 4 = 7

6 = 2 + 4

Knowing and finding number bonds within 10
Use five and ten frames to represent key number bonds.

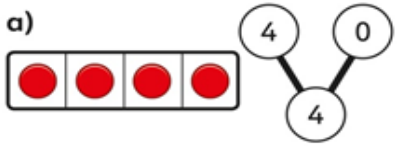
5 = 4 + 1



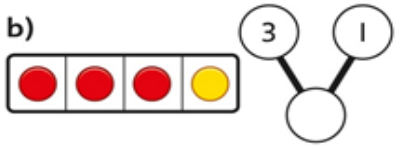
10 = 7 + 3

Knowing and finding number bonds within 10
Use a part-whole model alongside other representations to find number bonds. Make sure to include examples where one of the parts is zero.

a)



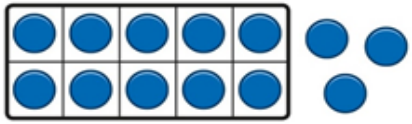
b)



4 + 0 = 4
3 + 1 = 4

Understanding teen numbers as a complete 10 and some more
Complete a group of 10 objects and count more.

Understanding teen numbers as a complete 10 and some more
Use a ten frame to support understanding of a complete 10 for teen numbers.



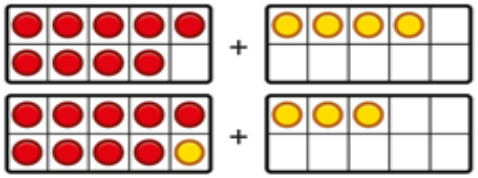
Understanding teen numbers as a complete 10 and some more.

1 ten and 3 ones equal 13.
10 + 3 = 13

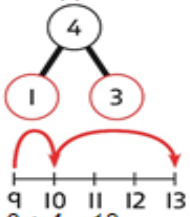
Bridging the 10 using number bonds
Children use a bead string to complete a 10 and understand how this relates to the addition.

7 add 3 makes 10.
So, 7 add 5 is 10 and 2 more.

Bridging the 10 using number bonds
Children use counters to complete a ten frame and understand how they can add using knowledge of number bonds to 10.

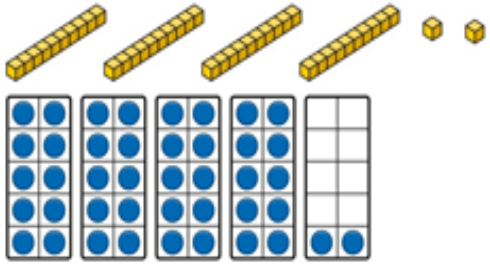
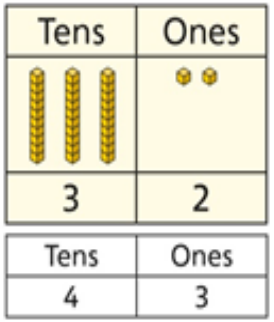
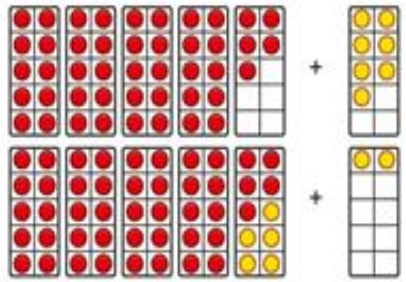
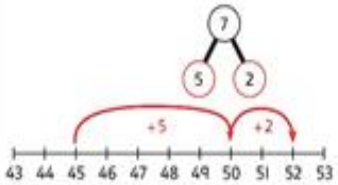


Bridging the 10 using number bonds
Use a part-whole model and a number line to support the calculation.



9 + 4 = 13

Addition in Year 2

Year 2			
	Concrete	**Pictorial**	**Abstract**
Year 2 Addition			
Understanding 10s and 1s	Group objects into 10s and 1s.  Bundle straws to understand unitising of 10s. 	Understand 10s and 1s equipment, and link with visual representations on ten frames. 	Represent numbers on a place value grid, using equipment or numerals.  Tens | Ones 3 | 2 Tens | Ones 4 | 3
Adding a 1-digit number to a 2-digit number bridging 10	Complete a 10 using number bonds.  *There are 4 tens and 5 ones.* *I need to add 7. I will use 5 to complete a 10, then add 2 more.*	Complete a 10 using number bonds. 	Complete a 10 using number bonds.  *7 = 5 + 2* *45 + 5 + 2 = 52*

Learning focus

In this lesson, children will develop their understanding of comparing numbers. Children will start to use their understanding of place value to aid them in their comparisons.

4 Use these cards to complete the sentences.

CHALLENGE

Use each card once.

6	9
2	8

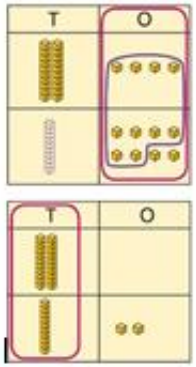
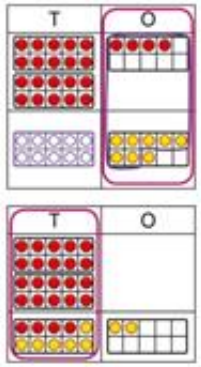
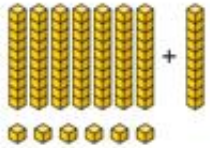
Two cards could go in the second box. I will look at the third box first and see what is left.

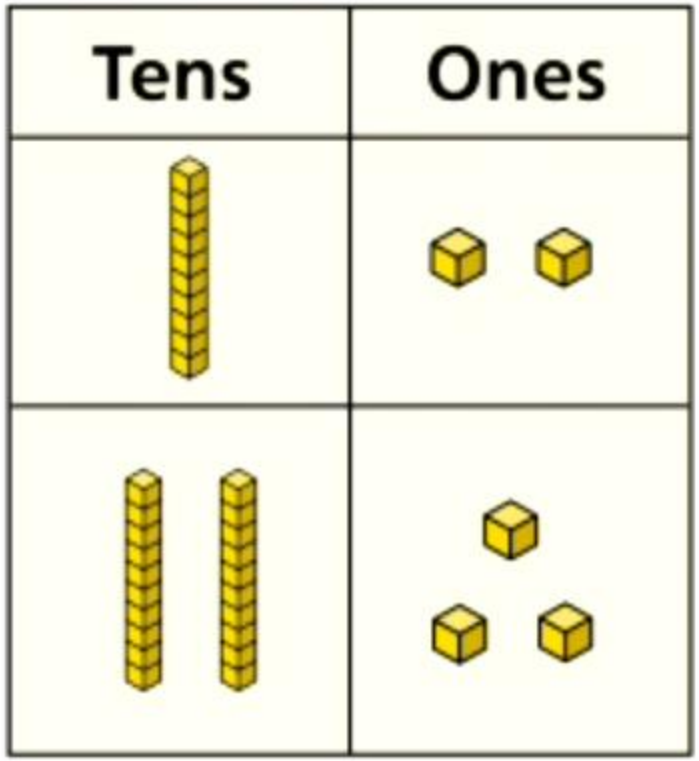
8 tens and 7 ones < ☐ tens and 5 ones.

4 tens and ☐ ones < 48.

☐ tens and ☐ ones < 32.

Addition in Year 2 (cont)

Adding a 1-digit number to a 2-digit number using exchange	Exchange 10 ones for 1 ten. 	Exchange 10 ones for 1 ten. 	Exchange 10 ones for 1 ten. 
Adding a multiple of 10 to a 2-digit number	Add the 10s and then recombine.  *27 is 2 tens and 7 ones.* *50 is 5 tens.* *There are 7 tens in total and 7 ones.* *So, 27 + 50 is 7 tens and 7 ones.*	Add the 10s and then recombine.  *66 is 6 tens and 6 ones.* *66 + 10 = 76* A 100 square can support this understanding. 	Add the 10s and then recombine. *37 + 20 = ?* *30 + 20 = 50* *50 + 7 = 57* *37 + 20 = 57*



12 + 23

Not aligning numbers

$$\begin{array}{r} 21 \\ +\ 50 \\ \hline 257 \end{array}$$

Not aligning numbers

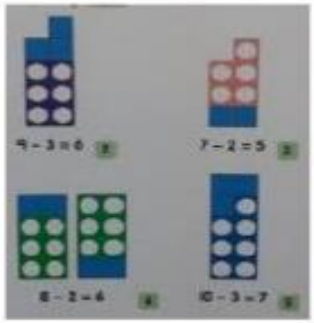
T	O
2	7
5	0
7	7

The Language of Addition

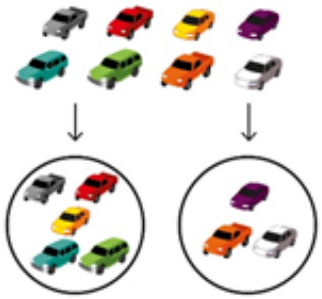
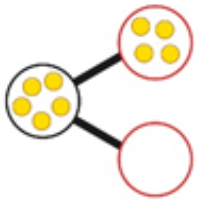
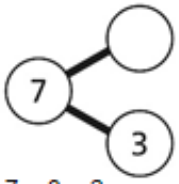
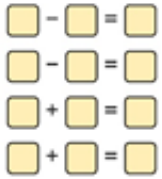
- +, add, more, plus
- make, sum, total
- altogether
- score
- double, near double
- one more, two more… ten more
- how many more to make…?
- how many more is… than…?
- how much more is…?

Addition and Subtraction in Reception

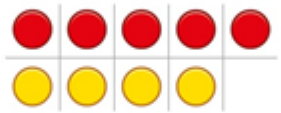
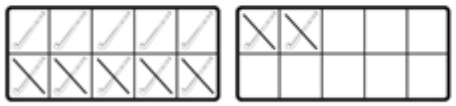
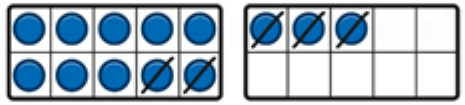
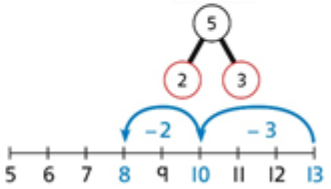
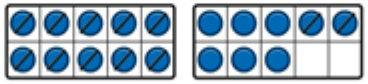
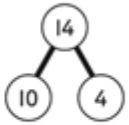
- Children need to have a secure knowledge of number in order to begin subtraction- it is introduced through practical games and activities.
- It is linked through number bonds and addition to reinforce the relationship between the two concepts.
- Children act out subtractions to physically subtract a number of objects from a group.
- This is reinforced by opportunities through play and provision.
- Adults model subtraction vocabulary e.g. "**subtraction** means we **take away** objects from a group / we have 11 **fewer** objects now.
- Adults support children in recording their subtractions in the written form on whiteboards and in their maths books.

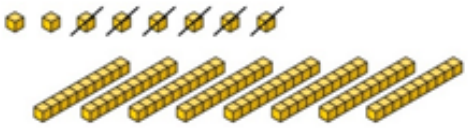
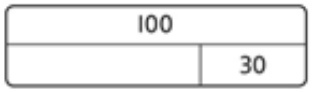
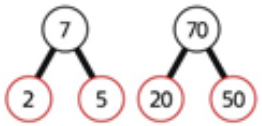
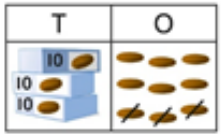
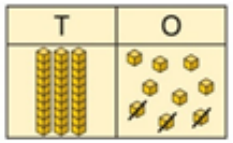
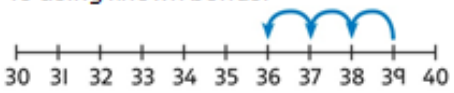
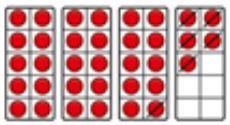
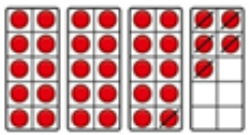
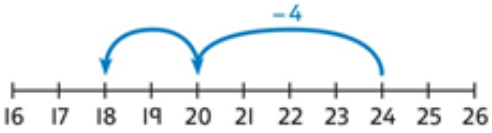

Subtraction in Year 1

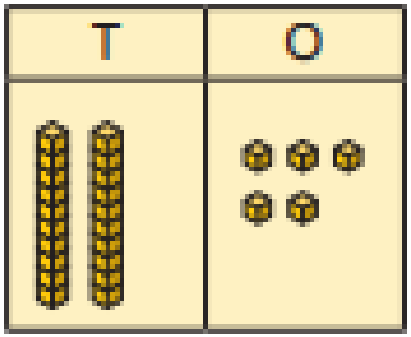
Year 1 Subtraction			
	Counting back and taking away Children arrange objects and remove to find how many are left.  *1 less than 6 is 5.* *6 subtract 1 is 5.*	**Counting back and taking away** Children draw and cross out or use counters to represent objects from a problem.  9 – ☐ = ☐ There are ☐ children left.	**Counting back and taking away** Children count back to take away and use a number line or number track to support the method.  *9 – 3 = 6*
	Finding a missing part, given a whole and a part Children separate a whole into parts and understand how one part can be found by subtraction.  *8 – 5 = ?*	**Finding a missing part, given a whole and a part** Children represent a whole and a part and understand how to find the missing part by subtraction.  5 – 4 = ☐	**Finding a missing part, given a whole and a part** Children use a part-whole model to support the subtraction to find a missing part.  *7 – 3 = ?* Children develop an understanding of the relationship between addition and subtraction facts in a part-whole model.  

Subtraction in Year 1 (cont)

	Finding the difference Arrange two groups so that the difference between the groups can be worked out.  *8 is 2 more than 6.* *6 is 2 less than 8.* *The difference between 8 and 6 is 2.*	**Finding the difference** Represent objects using sketches or counters to support finding the difference.  *5 − 4 = 1* *The difference between 5 and 4 is 1.*	**Finding the difference** Children understand 'find the difference' as subtraction.  *10 − 4 = 6* *The difference between 10 and 6 is 4.*
	Subtraction bridging 10 using number bonds For example: 12 − 7 Arrange objects into a 10 and some 1s, then decide on how to split the 7 into parts.  *7 is 2 and 5, so I take away the 2 and then the 5.*	**Subtraction bridging 10 using number bonds** Represent the use of bonds using ten frames.  *For 13 – 5, I take away 3 to make 10, then take away 2 to make 8.*	**Subtraction bridging 10 using number bonds** Use a number line and a part-whole model to support the method. *13 − 5* 
	Subtracting 10s and 1s For example: 18 − 12 Subtract 12 by first subtracting the 10, then the remaining 2.  *First subtract the 10, then take away 2.*	**Subtracting 10s and 1s** For example: 18 − 12 Use ten frames to represent the efficient method of subtracting 12.  *First subtract the 10, then subtract 2.*	**Subtracting 10s and 1s** Use a part-whole model to support the calculation.  *19 − 14* *19 − 10 = 9* *9 − 4 = 5* *So, 19 − 14 = 5*

Subtraction in Year 2

Year 2 Subtraction			
Subtracting multiples of 10	Use known number bonds and unitising to subtract multiples of 10.  *8 subtract 6 is 2.* *So, 8 tens subtract 6 tens is 2 tens.*	Use known number bonds and unitising to subtract multiples of 10.  *10 − 3 = 7* *So, 10 tens subtract 3 tens is 7 tens.*	Use known number bonds and unitising to subtract multiples of 10.  *7 tens subtract 5 tens is 2 tens.* *70 − 50 = 20*
Subtracting a single-digit number	Subtract the 1s. This may be done in or out of a place value grid.  	Subtract the 1s. This may be done in or out of a place value grid.  	Subtract the 1s. Understand the link between counting back and subtracting the 1s using known bonds.  T O 3 9 − 3 3 6 *9 − 3 = 6* *39 − 3 = 36*
Subtracting a single-digit number bridging 10	Bridge 10 by using known bonds.  *35 − 6* *I took away 5 counters, then 1 more.*	Bridge 10 by using known bonds.  *35 − 6* *First, I will subtract 5, then 1.*	Bridge 10 by using known bonds.  *24 − 6 = ?* *24 − 4 − 2 = ?*

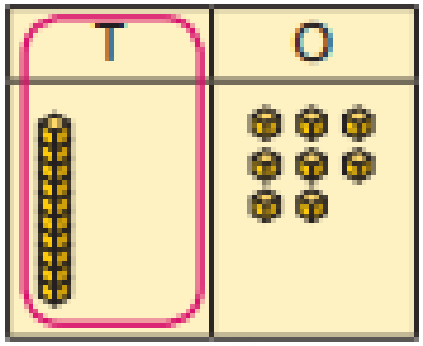


T	O
2	5
−	7

Step 1 – count out the tens and one

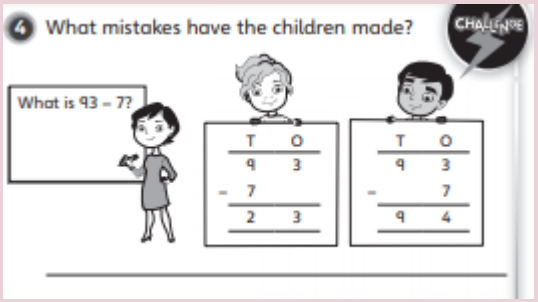
T	O
1 2	1 5
−	7
	8

Step 2 – exchange 1 ten for 10 ones

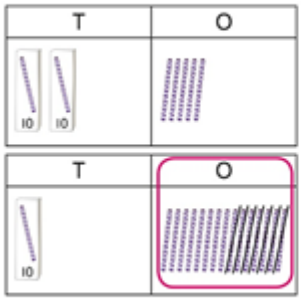
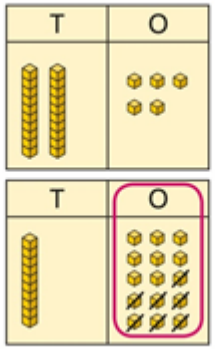
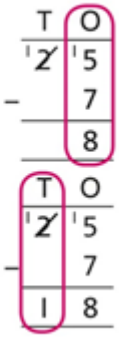
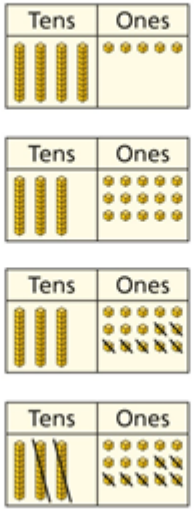
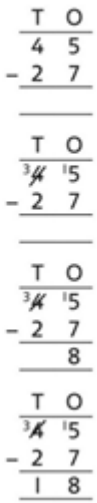


T	O
1 2	1 5
−	7
1	8

Step 3– subtract the ones and count what's left.



Subtraction in Year 2 (cont)

Subtracting a single-digit number using exchange	Exchange 1 ten for 10 ones. This may be done in or out of a place value grid. 	Exchange 1 ten for 10 ones. 	Exchange 1 ten for 10 ones.  *25 − 7 = 18*
Subtracting a 2-digit number with exchange		Exchange 1 ten for 10 ones. Then subtract the 1s. Then subtract the 10s. 	Using column subtraction, exchange 1 ten for 10 ones. Then subtract the 1s. Then subtract the 10s. 

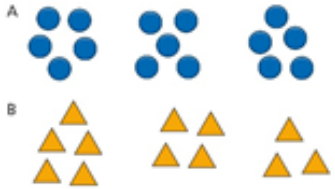
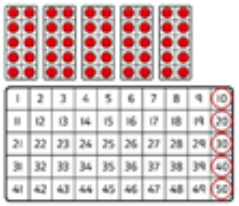
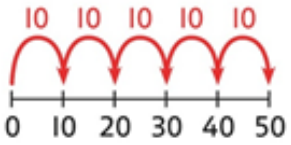
The Language of Subtraction

- −, subtract, take (away), minus
- leave
- how many are left/left over?
- how many have gone?
- one less, two less, ten less…
- how many fewer is… than…?
- how much less is…?
- difference between

Multiplication in Reception

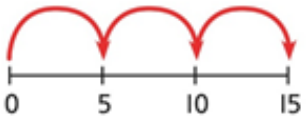
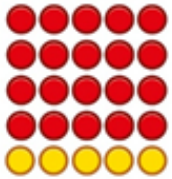
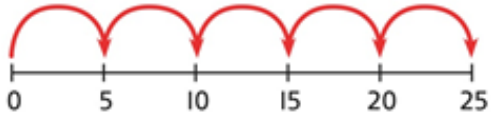
- By the end of Reception, children are expected to understand the concept of doubling and to be able to double a number up to 10.
- We teach the double facts as part of Big Maths as learned facts., 1+1 and 2+2 etc.
- Children also build an understanding of odd and even numbers which supports these concepts, especially with division later.

Multiplication in Year 1

Year 1 Multiplication	**Recognising and making equal groups** Children arrange objects in equal and unequal groups and understand how to recognise whether they are equal. 	**Recognising and making equal groups** Children draw and represent equal and unequal groups. 	**Describe equal groups using words** *Three equal groups of 4.* *Four equal groups of 3.*
	Finding the total of equal groups by counting in 2s, 5s and 10s  There are 5 pens in each pack … 5…10…15…20…25…30…35…40…	**Finding the total of equal groups by counting in 2s, 5s and 10s** 100 squares and ten frames support counting in 2s, 5s and 10s. 	**Finding the total of equal groups by counting in 2s, 5s and 10s** Use a number line to support repeated addition through counting in 2s, 5s and 10s. 

This is reinforced with Big Maths being able to count securely in 2,5's and 10's.

Multiplication in Year 2

Year 2 Multiplication			
Equal groups and repeated addition	Recognise equal groups and write as repeated addition and as multiplication.  *3 groups of 5 chairs* *15 chairs altogether*	Recognise equal groups using standard objects such as counters and write as repeated addition and multiplication.  *3 groups of 5* *15 in total*	Use a number line and write as repeated addition and as multiplication.  *5 + 5 + 5 = 15* *3 × 5 = 15*
Using arrays to represent multiplication and support understanding	Understand the relationship between arrays, multiplication and repeated addition.  *4 groups of 5*	Understand the relationship between arrays, multiplication and repeated addition.  *4 groups of 5 … 5 groups of 5*	Understand the relationship between arrays, multiplication and repeated addition.  *5 × 5 = 25*
Understanding commutativity	Use arrays to visualise commutativity.  *I can see 6 groups of 3.* *I can see 3 groups of 6.*	Form arrays using counters to visualise commutativity. Rotate the array to show that orientation does not change the multiplication.  *This is 2 groups of 6 and also 6 groups of 2.*	Use arrays to visualise commutativity.  *4 + 4 + 4 + 4 + 4 = 20* *5 + 5 + 5 + 5 = 20* *4 × 5 = 20 and 5 × 4 = 20*

CHALLENGE

3 A dragon is 2 times as tall as the king.

If the king is 5  tall, how tall is the dragon?

The dragon is ☐  tall.

I could use blocks to help with these calculations.

The Language of Multiplication

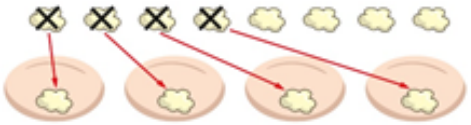
- lots of, groups of
- $\times$, times, multiply, multiplied by
- how many times have I got?
- once, twice, three times… ten times…
- repeated addition
- array
- double

Division in Reception

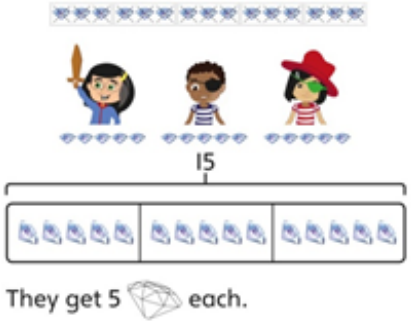
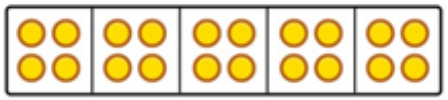
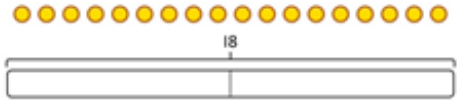
- By the end of Reception, children are expected to understand the concept of halving and sharing – distributing quantities equally.
- Children are then introduced to the concept of halving and sharing through practical games and activities.
- They act out ‘halving and sharing’ through activities such as sharing food for their Teddy Bear’s Picnic, sharing resources equally to play a game.
- This is reinforced by exploring their ‘doubling’ skills.



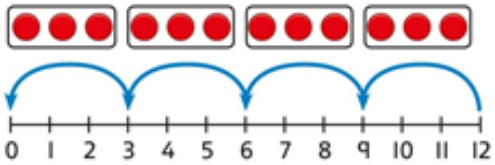
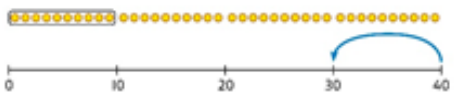
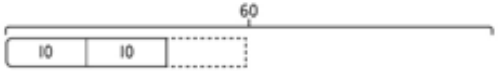

Division in Year 1

Year 1 Division	**Grouping** Learn to make equal groups from a whole and find how many equal groups of a certain size can be made. Sort a whole set people and objects into equal groups.  *There are 10 children altogether.* *There are 2 in each group.* *There are 5 groups.*	**Grouping** Represent a whole and work out how many equal groups.  *There are 10 in total.* *There are 5 in each group.* *There are 2 groups.*	**Grouping** Children may relate this to counting back in steps of 2, 5 or 10. 
	Sharing Share a set of objects into equal parts and work out how many are in each part. 	**Sharing** Sketch or draw to represent sharing into equal parts. This may be related to fractions. 	**Sharing** *10 shared into 2 equal groups gives 5 in each group.*

Division in Year 2

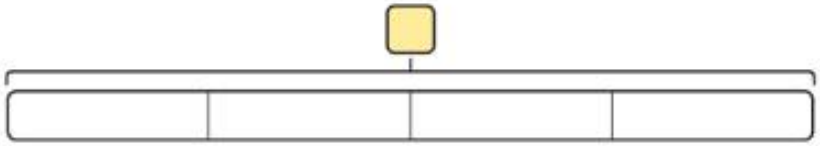
Year 2 Division			
Sharing equally	Start with a whole and share into equal parts, one at a time.  *12 shared equally between 2.* *They get 6 each.* Start to understand how this also relates to grouping. To share equally between 3 people, take a group of 3 and give 1 to each person. Keep going until all the objects have been shared  They get 5 each. *15 shared equally between 3.* *They get 5 each.*	Represent the objects shared into equal parts using a bar model.  *20 shared into 5 equal parts.* *There are 4 in each part.*	Use a bar model to support understanding of the division.  *18 ÷ 2 = 9*

Division in Year 2 (cont)

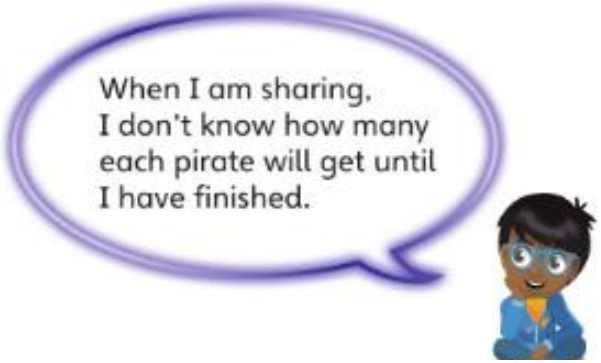
Grouping equally	Understand how to make equal groups from a whole.  *8 divided into 4 equal groups.* *There are 2 in each group.*	Understand the relationship between grouping and the division statements. 12 ÷ 3 = 4  12 ÷ 4 = 3  12 ÷ 6 = 2  12 ÷ 2 = 6 	Understand how to relate division by grouping to repeated subtraction.  There are 4 groups now. *12 divided into groups of 3.* *12 ÷ 3 = 4* *There are 4 groups.*
Using known times-tables to solve divisions	Understand the relationship between multiplication facts and division.  *4 groups of 5 cars is 20 cars in total.* *20 divided by 4 is 5.*	Link equal grouping with repeated subtraction and known times-table facts to support division.  *40 divided by 4 is 10.* Use a bar model to support understanding of the link between times-table knowledge and division. 	Relate times-table knowledge directly to division. 1 × 10 = 10 2 × 10 = 20 3 × 10 = 30 4 × 10 = 40 5 × 10 = 50 6 × 10 = 60 7 × 10 = 70 8 × 10 = 80 I used the 10 times-table to help me. 3 × 10 = 30. *I know that 3 groups of 10 makes 30, so I know that 30 divided by 10 is 3.* *3 × 10 = 30 so 30 ÷ 10 = 3*

4 pirates share 20  .

How many do they get each?



□ ÷ □ = □



4 5 children want a go on the trampoline before lunch.

CHALLENGE

They share the time equally for half an hour.

Draw a bar model to show how much time each child gets.

□ ÷ 5 = □

The Language of Division

- share, share equally
- one each, two each, three each…
- group in pairs, threes… tens
- equal groups of
- ÷, divide, divided by, divided into
- left, left over
- halve

Thank you for listening…

Any questions?