Waltham-on-the-Wolds CE Primary School

'Let your light shine' Matthew 5:16

Year 2 Reception Maths Long Term Plan 2022-2023

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number **Place value**				Number **Addition and subtraction**					Geometry **Shape**		
Spring	Measurement **Money**				Number **Multiplication and division**				Measurement **Length and height**	Measurement **Mass, capacity and temperature**		
Summer	**Statistics**				Number **Fractions**		Geometry **Position and direction**		**Problem solving**	Measurement **Time**		

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Year 2 Reception Maths Long Term Plan 2022-2023

Strand/ Half-term	Subitising	Cardinality, ordinality and counting	Composition	Comparison	Addition and subtraction/ Number facts
1 **Children will:**	• develop conceptual subitising skills as they become more familiar with patterns made by numbers within 10 and understand their composition • use perceptual and conceptual subitising when using a rekenrek.	• explore the linear number system within 10, looking at a range of representations • compare number tracks and number lines and explore the use of 'midpoints' to enable them to identify the location of other numbers.	• focus on the composition of numbers within 10, with a particular emphasis on the composition of numbers 6, 7, 8 and 9 as '5 and a bit', as well as exploring the composition of numbers 5 and 6 in-depth • explore the composition of odd and even numbers, identifying that even numbers are made of 2s and odd numbers have 'an extra 1' – they will link this to the 'shape' of these numbers.		• link their growing understanding of the composition of numbers within 10 to the related additive facts, including adding 2 to an odd or even number • practise recalling facts in a variety of ways, including through solving simple picture problems and completing equations with a missing sum or addend,
2 **Children will:**	• continue to practise conceptually subitising numbers they have already explored the composition of.	• review the linear number system as they compare numbers.	• continue to explore the composition of the numbers 7–9 in-depth, linking this to their understanding of odd and even numbers	• compare numbers within 10, linking this to their understanding of the linear number system • use the inequality symbols to create expressions, e.g. $7 > 2$, and use the language of 'greater than' and 'less than' • draw on their knowledge of number bonds to answer questions in the form: True or false? $5 + 3 > 7$	• continue to practise recalling additive facts for numbers within 10, using a range of equations, games and picture problems.

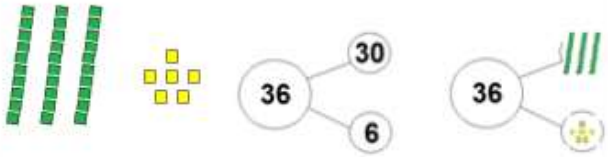
Year 2 Reception Maths Long Term Plan 2022-2023

Number and Place Value

Core concept: UNITISING and PLACE VALUE

Core skill: COUNTING ON and BACK

Grouping tens and some more drawing out the understanding that ten ones are equal to one ten.



thirty-six

3 tens and 6 ones

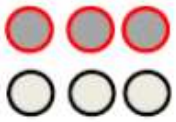
6 more than 30

Addition and Subtraction

Core concept: UNITISING

Core skill: DOUBLING and HALVING

Finding doubles and near doubles



I know that 3 add 3 makes 6.
So 3 + 4 must be 1 more.
3 + 2 must be one less.

How can we use this to add 13 + 14, 23 + 4 or 30 + 40?

Relate to subtraction e.g. 12 - 7 = ☐ and multiplication and division e.g. 3 + 3 = 2 x 3.

Multiplication and Division

Core concept: UNITISING

Core skill: COUNTING ON and BACK

Skip counting drawing on the concept of repeated groups in multiplication.

3 + 3 + 3 + 3 = 12

I can see 4 groups with 3 cars in each group. There are 12 cars altogether.

Year 2
Numbers to 100

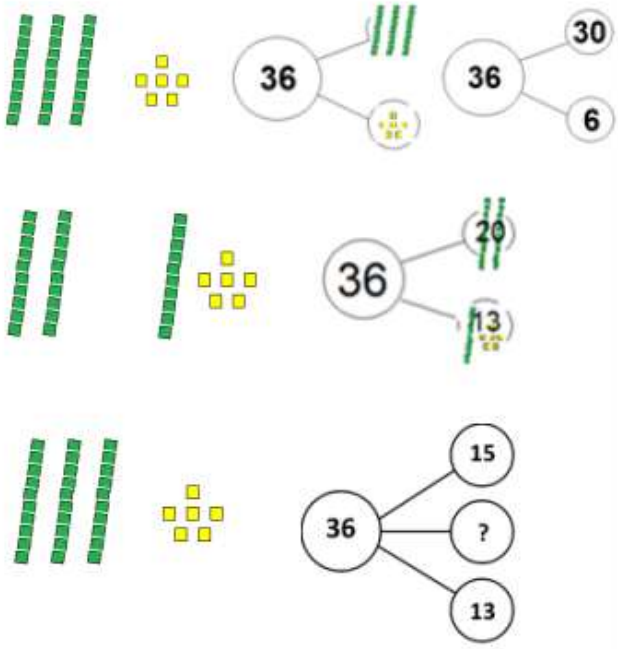
Year 2 Reception Maths Long Term Plan 2022-2023

Number and Place Value

Core concept: CONSERVATION and PLACE VALUE

Core skill: REGROUPING

Regroup 2-digit numbers flexibly and in multiple ways.



Addition and Subtraction

Core concept: CONSERVATION

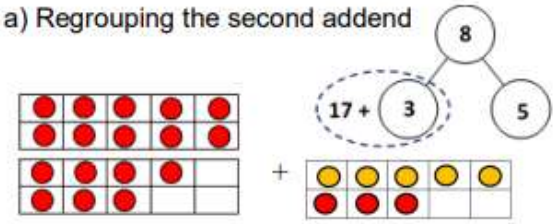
Core skill: REGROUPING

Think 10 for addition (Tens Ones + Ones)

Drawing out the skill of regrouping numbers to allow bridging through tens: Tens Ones + Ones. Exploring that either addend can be regrouped and utilise benchmark numbers.

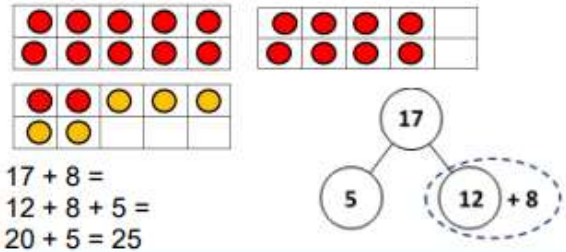
□ = 17 + 8

a) Regrouping the second addend



17 + 8 =
17 + 3 + 5 =
20 + 5 = 25

b) Regrouping the first addend



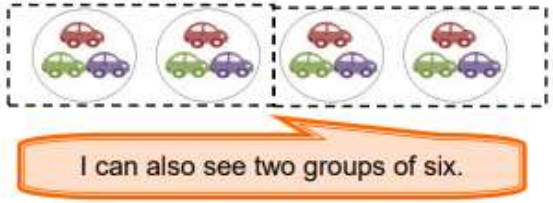
17 + 8 =
12 + 8 + 5 =
20 + 5 = 25

Multiplication and Division

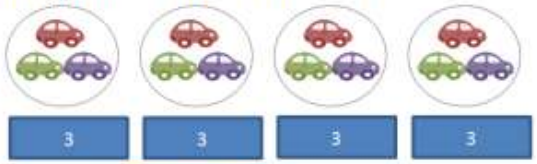
Core concept: UNITISING and SCALING

Core skill: DOUBLING and HALVING

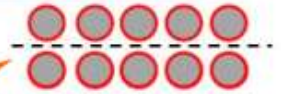
Doubles



Leading to linear and area models.



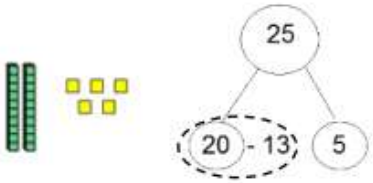
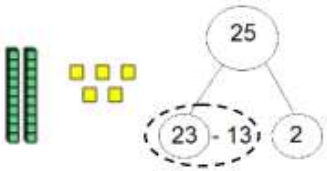
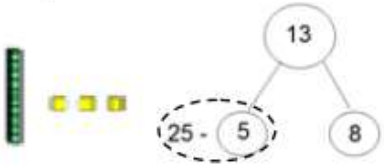
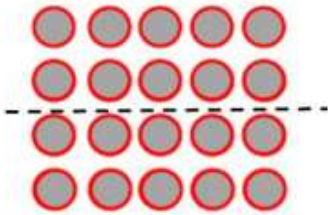
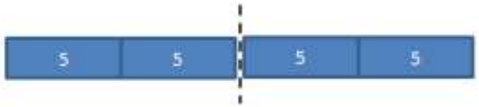
There are 4 groups of 3 cars. That is 12 cars altogether. I can see 12 cars with 4 groups of 3 cars.



2 x 5 is equal to double 1 x 5.

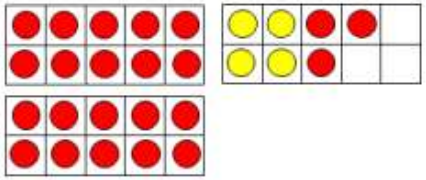
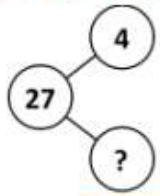
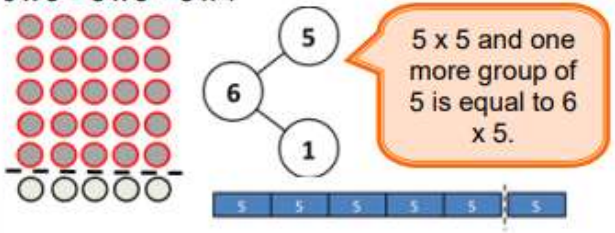
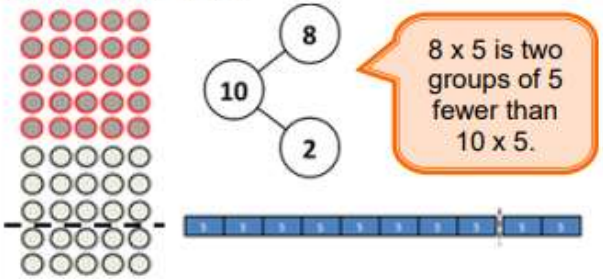
Year 2 Numbers to 100

Year 2 Reception Maths Long Term Plan 2022-2023

Number and Place Value	Addition and Subtraction	Multiplication and Division
	Think 10 for subtraction (Tens Ones - Ones) Exploring that either the minuend or the subtrahend can be regrouped. 25 - 13 = ☐ Regrouping the minuend (two examples). Taking from a multiple of ten or taking to a multiple of ten.  20 - 13 + 5 = 7 + 5 = 12  23 - 13 + 2 = 10 + 2 = 12 Regrouping the subtrahend – normally to a multiple of ten.  25 - 5 - 8 = 20 - 8 = 12	  4 x 5 is double 2 x 5. I can show it as an array and as a linear model.

Year 2
Numbers to 100

Year 2 Reception Maths Long Term Plan 2022-2023

Number and Place Value	Addition and Subtraction	Multiplication and Division
	Core concept: UNITISING **Core skill: FINDING COMPLEMENTS / REORDERING** Adding three, one-digit numbers such as 7 + 5 + 6 or 6 + 7 + 4 and drawing out the reasons why pupils may wish to reorder the numbers. Focus upon a range of strategies used. **Core skill: APPLYING THE INVERSE** **Think addition to solve subtraction** Tens Ones - Ones = ☐ without regrouping   27 - ☐ = 4 4 + ☐ = 27 I know 4 and 3 makes 7 so 4 and 23 make 27.	**Core concept: CONSERVATION** **Core skill: REGROUPING** Applying understanding of benchmark numbers. **Think 5 for multiplication and division** 6 x 5 = 5 x 5 + 5 x 1  5 x 5 and one more group of 5 is equal to 6 x 5. **Think 10 for multiplication and division** 8 x 5 = 10 x 5 - 2 x 5  8 x 5 is two groups of 5 fewer than 10 x 5.

Year 2 Numbers to 100

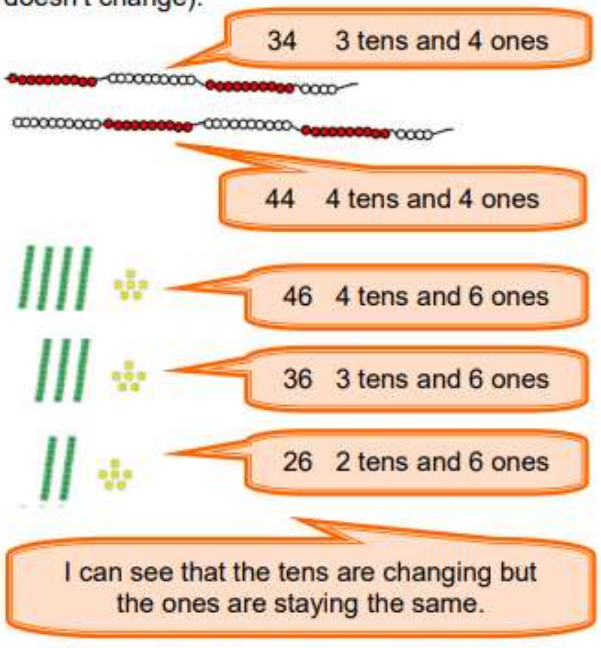
Year 2 Reception Maths Long Term Plan 2022-2023

Number and Place Value

Core concept: COUNTING and PLACE VALUE

Core skill: COUNTING ON and BACK

Counting on and back in ones and tens from any number allowing children to notice in the pattern what changes as a result (and what doesn't change).



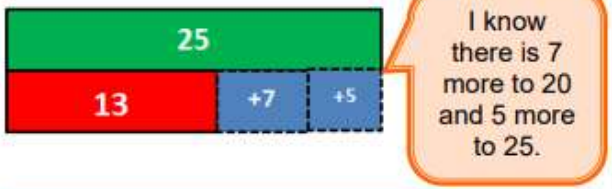
Then counting with coins and on scales from any amount.

Addition and Subtraction

Core concept: COMPARISON

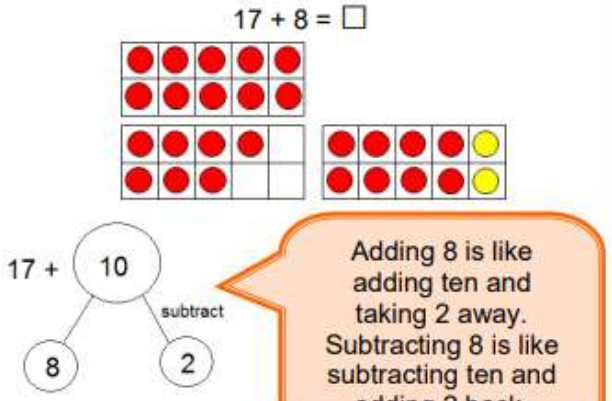
Core skill: COUNTING ON and BACK

Drawing out complements to benchmark numbers.



Core skill: COMPENSATION

Compensation at this stage is a form of **Think 10**, utilising benchmark numbers.



Apply this to subtraction.

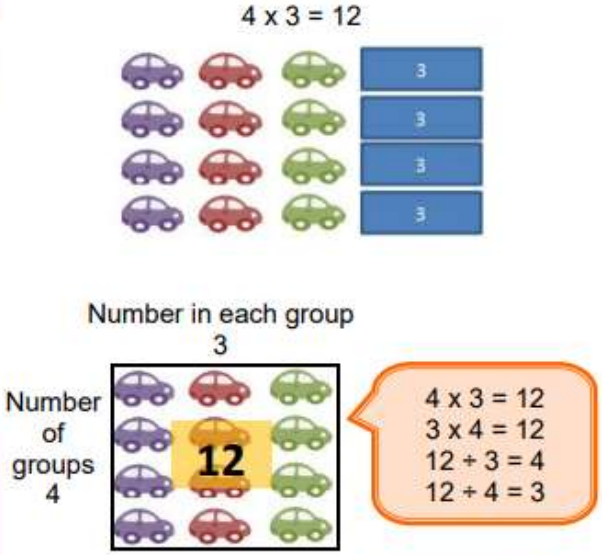
Multiplication and Division

Core skill: APPLYING THE INVERSE

Think multiplication
Introduction of the array and linear model to explore how the relationship of multiplication and division relate.

In multiplication, explore how multiplier, multiplicand and product interrelate.

In division, explore how dividend, divisor and quotient interrelate and link to multiplication.



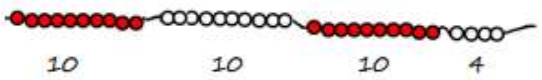
Year 2 Numbers to 100

Year 2 Reception Maths Long Term Plan 2022-2023

Number and Place Value

Core concept: COMPARISON and PLACE VALUE

Comparing numbers using tens as **benchmark numbers.**



34 - 4 = 30
4 + 30 = 34
30 = 34 - 4
4 = 34 - 30

34 is 4 more than 30.
4 more than 30 is 34.
30 is 4 fewer than 34.
30 fewer than 34 is 4.

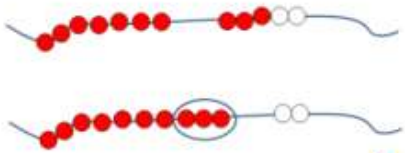
Explore the language of 'more than' and 'less than' through measures and bar charts.

Addition and Subtraction

Core concept: CONSERVATION and SUM

Core skill: REBALANCING

Equal Sum drawing out understanding that the sum remains equal when we rebalance the addends in an addition calculation.



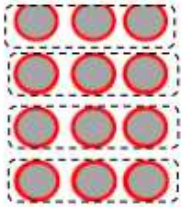
I can prove that 7 + 5 = 10 + 2 using a bead string.

Multiplication and Division

...continued

12 ÷ 3 = 4

I can see that 3 can be taken from 12, four times.



I can see that 12 can be shared into 4 equal groups with 3 in each group.

I know that I can use 4 x 3 = 12 to answer 12 ÷ 3 or 12 ÷ 4.

Year 2
Numbers to 100

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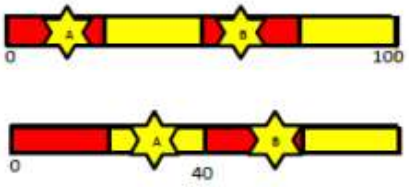
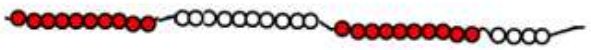
Number and Place Value

Core concept: MAGNITUDE

Core skill: ESTIMATION



Drawing out understanding of the distance of numbers to target numbers.



24 is 4 away from 20 and 6 away from 30. 24 is nearer to 20 than to 30.

Addition and Subtraction

Core concept: COMPARISON

Core skill: REBALANCING

Equal Difference drawing out understanding that adding or subtracting the same quantity from both the subtrahend and minuend maintains the difference between the numbers.

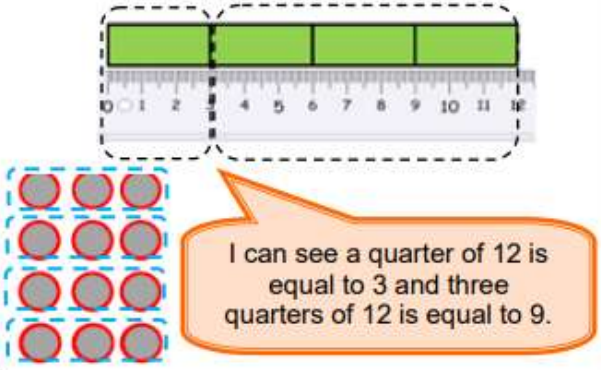
5 - 3 is equal to 7 - 5

5 - 3 is equal to 3 - 1

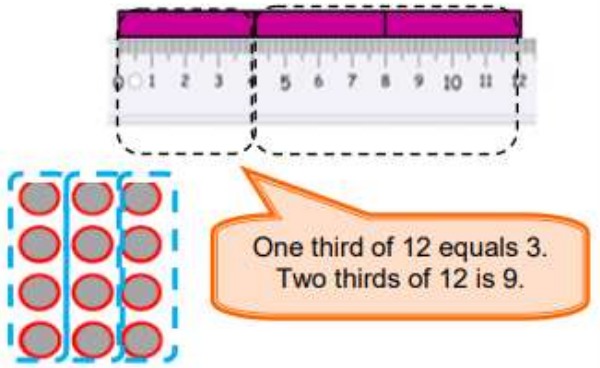
Multiplication and Division

...continued

Leading to fractional understanding



I can see a quarter of 12 is equal to 3 and three quarters of 12 is equal to 9.



One third of 12 equals 3. Two thirds of 12 is 9.

Year 2
Numbers to 100

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Key Stage 1 Examples

'Think 10' Regroup

5 + 6 7 + 4 9 + 7 7 + 6 8 + 7 7 + 5
2 + 18 4 + 18 8 + 19 47 + 6 68 + 7 9 + 87
13 - 8 27 - 8 53 - 6 68 - □ = 7 73 + □ = 89

Examples from 2016 KS1 Paper 1 and Sample Arithmetic Paper

8 + 6 = □ 5 + 7 = □ 12 - 7 = □ 46 + 7 = □
8 + 5 + 4 = □ 55 + 17 = □ 71 - 14 = □
86 - 21 = □ 65 + □ = 93

'Think Addition' for subtraction

8 - 5 9 - 6 6 - 2 80 - 50 19 - 6 60 - 20

Examples from 2016 KS1 Paper 1 and Sample Arithmetic Paper

10 - □ = 2 □ + 5 = 9 12 - 7 = □ 19 - 9 = □
17 - 6 = □ 39 - 8 = □ 50 - □ = 20 56 - □ = 51

Reordering and finding complements

5 + 4 + 5 2 + 3 + 8 2 + 4 + 6 6 + 3 + 7
36 + 5 + 4 54 + 26

Examples from 2016 KS1 Paper 1 and Sample Arithmetic Paper

4 + 5 + 6 = □ 36 + 24 = □ 69 + 11 = □

Compensation

2 + 9 12 + 9 9 + 72 2 + 19 19 + 42 42 + 39
5 + 8 15 + 8 65 + 8 18 + 5 55 + 18 48 + 35
12 - 9 22 - 9 52 - 9 52 - 19 92 - 19 92 - 39
12 - 8 22 - 8 52 - 8 52 - 18 92 - 18 92 - 48
48 + □ = 92 8 + □ = 52

Examples from 2016 KS1 Paper 1 and Sample Arithmetic Paper

8 + 6 = □ 52 + 7 = □ 28 + □ = 35 69 + 11 = □
55 + 17 = □ 39 - 8 = □ 43 + 38 = □ 70 - 18 = □

Rebalancing - Equal sum

12 + 9 9 + 72 24 + 19 15 + 42 44 + 37
5 + 8 15 + 8 65 + 7 18 + 6 55 + 15
48 + 35

Examples from 2016 KS1 Paper 1 and Sample Arithmetic Paper

8 + 6 = □ 4 + 5 + 6 = □ 69 + 11 = □
55 + 17 = □ 36 + 24 = □ 43 + 38 = □
8 + 5 + 4 = □

Rebalancing - Equal difference

32 - 7 25 - 8 55 - 7 55 - 17 92 - 19
97 - 43 48 + □ = 92 8 + □ = 55

Examples from 2016 KS1 Paper 1 and Sample Arithmetic Paper

12 - 7 = □ 28 + □ = 35 71 - 14 = □
39 - 8 = □ 86 - 21 = □ 70 - 18 = □
65 + □ = 93

Reordering and multi-strategy

Examples from 2016 KS1 Paper 1 and Sample Arithmetic Paper

8 + 5 + 4 = □

Double and near double facts

3 + 3 30 + 30 32 + 32 3 + 4 30 + 40
6 - 3 60 - 30 64 - 32 7 - 3 70 - 40
6 - □ = 3 60 - □□ = 30 64 - □□ =
□□ - 3 = 64

Find two ways of solving this: 70 - □0 = □0

Examples from 2016 KS1 Paper 1 and Sample Arithmetic Paper

12 - 7 = □ □ + 5 = 9 50 - □ = 20

Make links to doubling and halving

3 + 3 = 2 x 3 2 x 30 2 x 3 + 1
6 ÷ 2 60 ÷ 2

Ensure that pupils can halve odd multiples of ten
50 ÷ 2 =

Examples from 2016 KS1 Paper 1 and Sample Arithmetic Paper

3 x 2 = □ 2 x 0 = □
8 ÷ 2 = □ ½ of 16 = □ ½ of 30 = □
12 ÷ 2 = □

Year 2 Reception Maths Long Term Plan 2022-2023

Key facts	
Year One Recall • Number bonds within 10 including a + b + c = d, the effect of adding zero and missing number calculations • Reordering to find tens and some more e.g. 4 + 5 + 6 = • Doubles within 10 including subtraction e.g. 6 - 3 = 3 and missing numbers e.g. 6 - ☐ = 3 • Structured subitisation on tens frame to 20	**Year Two Recall** • Addition and subtraction facts to 20 • Multiplication and division facts 2, 5 and 10 x tables • Multiplication facts for 3 x tables • Number of minutes in an hour; number of hours in a day • Coin recognition up to £2 • Doubles to 20

Year 2 Reception Maths Long Term Plan 2022-2023

Year 2

Curriculum Links

Underlying Skill	Linked to Y2 Learning Objectives
Doubling and halving	• Recognise the place value of each digit in a two-digit number (tens, ones) • Identify, represent and estimate numbers using different representations, including the number line • Use concrete objects, pictorial representations, and mental methods to add and subtract a two-digit number and ones, two-digit number and tens, 2 two digit numbers and 3 single digit numbers. • Recall and use addition and subtraction facts to 20 fluently and derive and use related facts up to 100 • Recall and use multiplication and division facts for the 2 multiplication table • Recognise odd and even numbers
Subtraction from a Multiple of Ten (Teach this before teaching bridging)	• Identify, represent and estimate numbers using different representations, including the number line • Use place value and number facts to solve problems • Recall and use addition and subtraction facts to 20 fluently and derive and use related facts up to 100 • Recognise the place value of each digit in a two-digit number (tens, ones)
Bridging	• Identify, represent and estimate numbers using different representations, including the number line • Use place value and number facts to solve problems • Use concrete objects, pictorial representations, and mental methods to add and subtract a two-digit number and ones. • Recall and use addition and subtraction facts to 20 fluently and derive and use related facts up to 100. • Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (÷) and equals (=) signs. • Show that multiplication of two numbers can be done in any order and (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.
Repeated Addition and Skip Counting	• Count in steps of 2, 3 and 5 from 0, and in tens from any number • Recall and use multiplication and division facts for the 2, 5 and 10 multiplication table • Identify, represent and estimate numbers using different representations, including the number line • Use concrete objects, pictorial representations, and mental methods to add three one-digit numbers

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	• Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (÷) and equals (=) signs. • Show that multiplication of two numbers can be done in any order and (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.
Investigating Properties and Relationships	• As above. • Use concrete objects, pictorial representations, and mental methods to add three one-digit numbers

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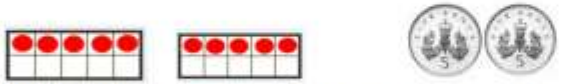
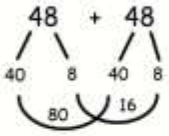
Year 2 Guidance

Underlying Skill: Doubling

Notes	Concrete	Visual to Support Abstract
Revise doubles up to 5+5 and use with partitioning/place value to work out new facts up to 10+10. Extend and consolidate strategies throughout work with 2 digit numbers. Doubles may also be found by bridging (see page 29). As part of the work on doubles, teach children to visualise and exploit number relationships, by making use of near doubles: Show 6+6. What would 6+7 be?	If 5+5=10, what would 6+6 be? How do you know?  What about 7+7? (Draw attention to it as 5+5+2+2, so known facts can be used). Represent with apparatus in part-whole models and bar models. Use a range of apparatus. Hide half for children to guess the whole amount. E.g. This is half my tower. What does my whole tower look like? Prove it.  Build in opportunities to consolidate doubling throughout addition work. E.g. Addition of 3 single digits ⟶ 6+3+6 2 digit+1 digit ⟶ 36+6 2 digit +2 digit ⟶ 48+48 =80+16 	 Show a picture of half of an amount. Draw the rest of the objects/tower/number line etc. Put into bar models and part whole models. Show on number line.  What is double 48? How did you work it out?  Did anyone find it a different way? (E.g. 48+40=88. 88+8).
Reasoning (to address misconceptions/mistakes or make predictions and generalisations).	• Erin says 46+46=86. What is her mistake? • True or false: double 37>60. How do you know? • Double 7<____. What could it be? What couldn't it be? • Tianna says double 27 is 56 but Rory says he knows this can't be correct. Explain how he knows. (Doulbe 6=12 so there should be 2 in the ones).	

Waltham-on-the-Wolds CE Primary School

'Let your light shine' Matthew 5:16

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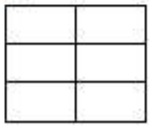
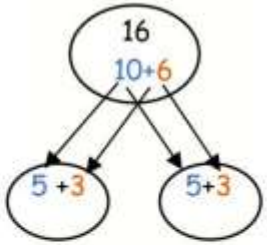
Underlying Skill: Halving

Notes	Concrete	Visual to Support Abstract
Use equipment where the ten group is obvious, such as tens frame, Numicon or cubes in sticks of ten with ones. Halving will also be carried out with shapes and other objects, but for the purpose of times tables, this programme focuses on number only. It is important to move beyond sharing out apparatus and use the structure of numbers to build mental strategies.	Use a range of concrete apparatus to halve intially by sharing on laminated part-whole and bar models. What is the whole amount? How many parts? What is important about the parts?  Give cubes in two different colours. Build a tower. What would half your tower look like? Practise building, snapping in two to make two equal parts and comparing each part. Recap halves of numbers up to 10. Build me a tower that is half white etc. How can you check that half is white?  Beau says these tower are half yellow? Is he right? Repeat the above activities with numbers to 20. Use knowledge of halves to ten and place value to halve teens numbers up to 20. What is half of 10? So what would half of 12 be? (Halve the 10, halve the 2). What about 14? 16?  What about half of 26, 84 etc.	 Colour half of a tower picture or grid. Write the fractions sentence to go with it.  Half of 16 
Reason to address misconceptions or help make generalisations.	• David has 26 cubes. He says if he gives half away, he will have 16 left. Explain his mistake. Prove it. • Jess has three towers of bricks. One is 14 cubes tall, one is 15 cubes tall and one is 17 cubes tall. Half of one tower is white. Which tower? Explain how you know.	

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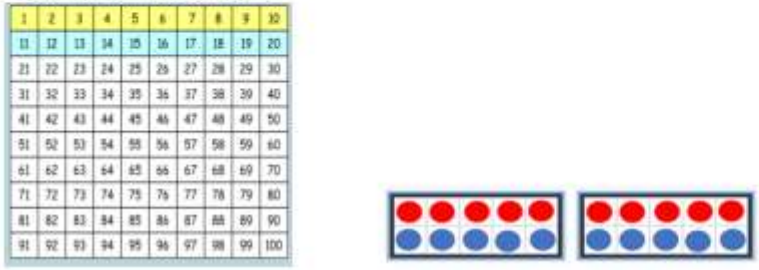
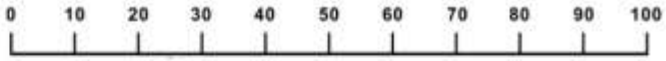
Underlying Skill: Subtraction from a Multiple of Ten

Notes	Concrete	Visual to Support Abstract
This skill links to the later strategy for finding the ninth multiple, so it must become automatic. It also consolidates number bonds to ten.	Show this in a range of ways: full tens frames, number pieces, sticks of ten cubes horizontally across 100 square etc. E.g. 10-2=8. What would 20-2=  Give an empty 100 square. Write on the multiples of 10. If 10-2=8, write in 20-2,30-2 etc.  Look at the number line. If I jump back 2 from 10, where will I land? What about 20,30 etc?	Write the multiples of ten on an empty 100 square. Use it work out 10-2, 20-2, 30-2 etc. 40-6=  Draw place value counters to work out, gradually moving towards mental methods. Show where 30-2, 40-2,50-2 etc will be on an empty number line. 
Reason to address misconceptions or generalise.	I use my empty 100 square/number line to work out that 50-4=56. What mistake have I made? Use concrete equipment to prove it. Look at the pattern: 10-3=7 20-3=17 30-3=27 What would come next? Prove it. I know 10-6=4, what other subtraction facts can I work out? Can these help me find any addition facts?	

Waltham-on-the-Wolds CE Primary School

'Let your light shine' Matthew 5:16

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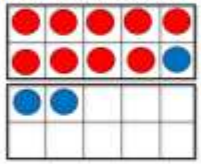
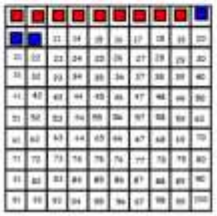
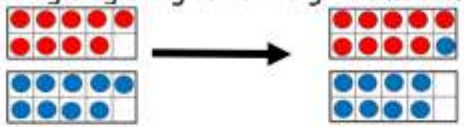
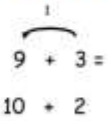
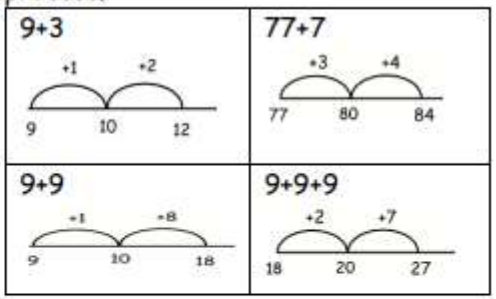
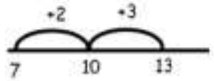
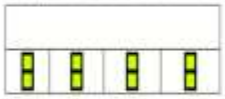
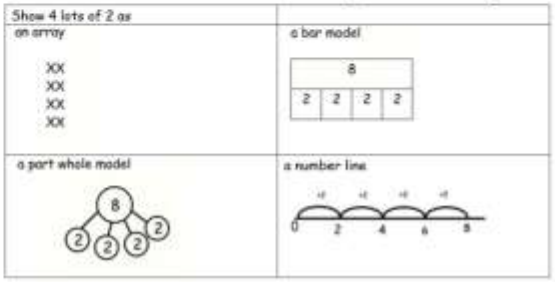
Underlying Skill: Bridging

Notes	Concrete	Visual To Support Abstract
This reinforces the key skills of number bonds, partitioning and place value, whilst allowing children to manipulate numbers and develop mental methods. Before learning to bridge with 2 digit numbers, children must be able to identify the ten before and after it. They must also be able to add single digits to multiples of ten and know how many would be needed to reach the next ten.	Use tens frames alongside number lines and 100 squares with cubes placed on top to show how to use the ten as a 'bridge' to rest at.  Begin by adding a single digit to 9. Show it on 2 tens frames or with 9 counters on a number track to 10 and 3 other loose counters. Ask the children to predict what the total will be when put together, so they can visualise the movement of the counters. Then physically move it, so 9+3 becomes 10+2. Repeat with 9+4,9+5 etc.  Gradually introduce other numbers (8+3,8+4 etc) once confident. It can be also explored through placing different coloured cubes on top of tens frames or 100 squares. The strategy can then be used with larger numbers, e.g. 18+4, 27+5, 79+7 when adding single digits to 2 digit numbers.  Bridging can also be used to develop mental doubling. What would 9+9 be? Explain how you know. Once established, build in opportunities to triple numbers by doubling then bridging the last number, e.g. 8+8+8 as this lays strong foundations for the three times table, as well as consolidating doubles. Bridging can be taught as part of the work on addition of single digits to 2 digits numbers.	Colour squares on a 100 square to show cubes added or draw counters added in a tens frame. An arrow can be used to show how one of the 3 has moved to the 9 to make an equivalent (easier) calculation – 10+2.  It is also useful to show it on a number line, as children can draw their own as a stage between the concrete and the abstract to help them imagine the process. 
Reason to address misconceptions or to generalise.	David worked out 7+5 like this. Is he right? Explain your thinking.  	

Year 2 Reception Maths Long Term Plan 2022-2023

2x Table: Relationship Between Repeated Addition and Skip Counting

Notes	Concrete	Visual to Support Abstract
Make the point that reading and recording repeated addition calculations is time consuming, so it can be referred to 'lots of', The multiplication sign can be shown to represent the 'lots of'. It is important to investigate the relationships between multiples when skip counting.	Give real life problems involving repeated addition of two and use concrete materials to act out the problem and solve. Draw to show.  2+2+2= Match apparatus to repeated addition statements and then multiplication statements and vice versa. Place concrete apparatus in twos along a counting stick and mark on the multiples. Point to a multiple and ask the children to write the repeated addition then the multiplication.   Get out coins to represent repeated addition and multiplication calculations. How much money is there? Write the repeated addition calculation and the multiplication statement. How much would there be if I added 2p more? Spent 2p? etc. Find out. Place cubes over numbers on 100 square to match calculations then use them to solve calculations.  Use part whole and bar models and discuss which are the parts and which is the whole.  Put twos in the parts. Describe the parts and the whole in a number sentence. Now show the whole amount. How many groups of two will you get? Match and later write repeated addition, multiplication and division calculations to match.	Once children are secure with one way to visually represent, explore different ways. E.g. show 3 lots of 2 as a repeated addition, practically and on a 100 square, number track or number line, in an array.  Draw pictures and use visuals to represent and help expose the relationships within multiplication problems and the link to division. Match different representations to calculations and find visual representations which show a given calculation. Make up problems to represent different visuals or calculations. Draw visual representations to solve problems. These may begin as simple pictures then move onto number lines, part whole models etc. Ensure examples include multiplying by 1 and 0.

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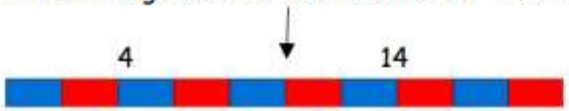
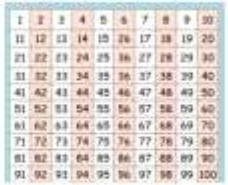
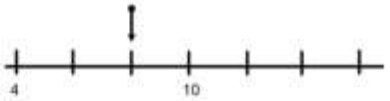
	After lots of practical experiences, show how the x sign can be used as a quicker way to express 'lots of'. (If children are confusing the multiplication and the addition sign, use x to cross out 'lots of') as a prompt for those confusing the orientation. Use the counting stick methods (see page 7) to explore relationships between multiples of 2 and find more efficient ways to derive them using underlying skills and known facts. What do you think 11x2 would be? 12x2? How do you know? Once confident with the counting stick, the teacher can model relationships and missing numbers on a number line. The counting stick can also be used for the reading scales link:  Give out number cards from 1 to 20. Use cubes to put numbers into twos. What do you notice?	Colour to show the pattern of the two times table. What are the numbers you haven't coloured called? What are the multiples of two called? What do you notice about each?  How many twos did you count to reach 10? How many do you think you will count to reach 20? Where would 14 go? What about 13?  Sort the numbers cards which could and couldn't be put into twos. Predict which numbers in the 20s could be put into twos etc.
Reason to address misconceptions or help make generalisations.	• Count in twos to solve this: 2+2+2+2= • What can help you solve this: 2+5+2+2= • True or false: 9x2<4x2? Explain how you know. • Look at these numbers: 10, 20, 30, 40. Which can be put into twos and which can't? Use concrete apparatus to find out. • Which is the odd one out: 23,18,17? Explain why.	

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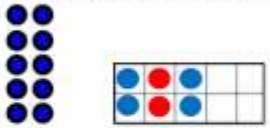
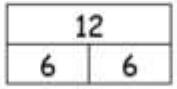
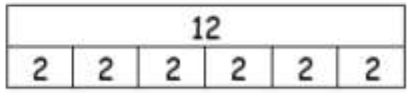
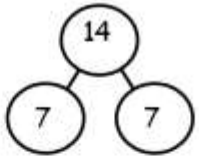
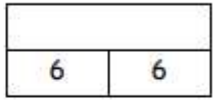
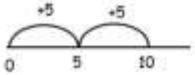
2x Table: Investigating Relationships (Scaling - Doubles Link).

Notes	Concrete	Visual to Support Abstract
Link x2 to doubling, as doubling is needed when multiplying larger numbers by 2 (e.g. 34x2). Teach doubles before x2, so the link can be made. Ensure that some problems involve scaling up by 2 (doubling) as well as counting in twos, using language such as twice as much, double and two times (E. 3x2 can mean 3 two times or 3 lots of 2).	Use apparatus to represent and solve doubles problems.  Investigate relationships between skip counting in twos and doubling by making arrays (see page 21). Match calculations to concrete representations and use apparatus to show calculations in different ways. E.g. show it with coins, cubes etc. True or false- 2 lots of 5=5 lots of 2. Why? Prove it. What would 2x6 look like on a part whole model/bar model? What about 6x2? Use concrete apparatus to make an array to show a given calculation. Write 2 repeated addition and 2 multiplication calculations (and later division) for an array made by your partner. Identify the repeated addition to match a problem. e.g. Does a problem require 4+4 or 2+2+2+2? Given concrete apparatus, make up a problem that it could represent.	Represent problems and calculations visually by drawing circles or crosses in an array, bar models and part whole models. E.g. show 2+2+2+2+2+2, now show double 6. Explain what you drew each time. Write multiplication calculations to match. What's the same? What's different?   Record and solve problems and calculations visually in a range of ways. Write a repeated addition, multiplication, division calculation to match each visual.   Write problems to match calculations and visuals. Explore associated language, making clear that x2 can mean lots of or two times as many.
Reasoning to address misconceptions or help make generalisations.	• Show 7 lots of 2 on a number line/bar model/part whole model. Now show 2 lots of 7. What's the same? What's different? • Does the number line show 5 lots of 2 or 2 lots of 5? Explain.  Always, sometimes, never: double 7 = 7x2? Double 43=43x2?	

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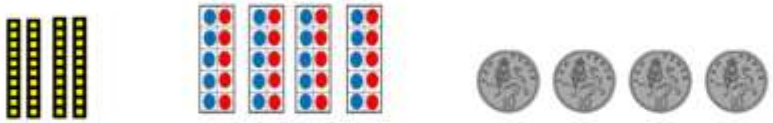
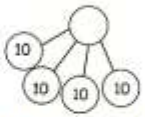
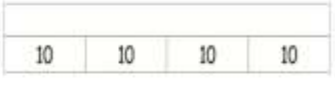
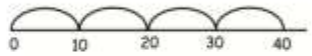
10x Table: Relationship Between Repeated Addition and Skip Counting

Notes	Concrete	Visual to Support Abstract
Make the point that recording and reading repeated addition calculations is time consuming, so we can refer to them as lots of 10. Count past 100 and show what happens when we reach 10 lots of ten. Ensure examples which include multiplying by 1 and 0 are included.	Give real life problems involving repeated addition of ten and use apparatus to act out the problem and solve.  Write it as a repeated addition. How else could we say it? 10+10+10+10 or 4 lots of 10.  Place tens horizontally across a 100 square to show the relationship. On an empty 100 square, what number would 4 tens come to? How many tens are in 40? Show on a 10x10 peg board. Put out cards with multiples of ten on them. Muddle them up for children to reorder and place on an empty number track or line. Which numbers would go in between the multiples of ten? Check with apparatus. Put apparatus into part-whole models and bar model and discuss which are the parts and which is the whole. Describe them using repeated addition and multiplication calculations. What would the division calculation be?  Use counting stick methods (see page 7) to explore the relationships between multiples of 10 and find more efficient ways to derive them using underlying skills and known facts. What is 11x,12x? How do you know?	 Colour to show calculations, e.g. 2x10. Write the repeated addition and multiplication calculations to match. What number is this pointing to? How could you find out?  Record one calculation in a range of ways – an array, part whole model, bar model, number line etc.     What does the part whole model show? Find a different visual that shows the same calculation. Match calculations to visuals and vice versa. Use different representations to show or solve a problem. Write a problem to show a calculation.

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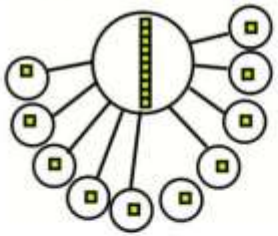
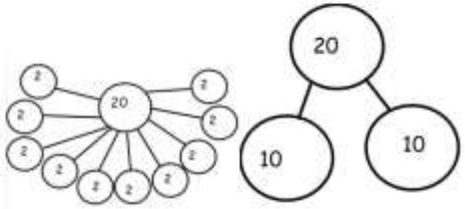
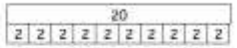
10x Table: Investigating Relationships

Notes	Concrete	Visual to Support Abstract
It is important to investigate, not just 10 lots of something, but also idea of scaling by making 10x greater as this is fundamental to the later understanding of place value. Use language related to scaling, e.g. 10 times as much/many, 10 times greater and give practical problems including these.	Make arrays (see page 21) to show different multiplication/repeated addition calculations. Use them to discuss the commutative property. E.g. Discuss how this can show both 10x4 and 4x10 (10+10+10+10 or 4+4+4+4+4+4+4+4+4+4). Match calculations to concrete representations.  Extension: Discuss the relationships that exist whilst working with practical equipment. What else could this represent? E.g. 2 lots of 2x10 or (2x10 and 2x10) or 4 lots of 2x5 or 1 lot of 10 and 3 lots of 10 etc.  Investigate what happens when we make ones 10x bigger. Also, show on bar models. Write the repeated addition. Write the multiplication. What would the whole be if we put 2 in each part? How about 3? etc. What division calculation would this show?	Match pictures of arrays to calculations and vice versa. Draw arrays, part whole models and bar models to match calculations and to solve calculations and problems. Look at the visuals. What's the same? What's different?   20 10 10 Write a word problem to go with a visual or calculation.
Reasoning to address misconceptions or help make generalisations.	What do you notice about the multiples of ten? Which is the odd one out? Why? 10, 18, 20, 40, 110. 10x4>_____What could it be? What couldn't it be? True or false: 10x3<3x10. Explain how you know.	

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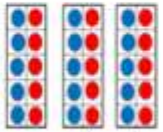
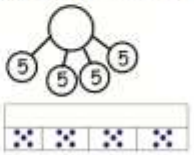
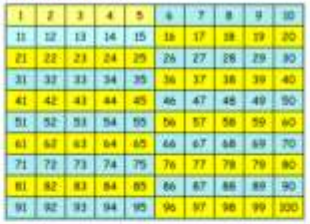
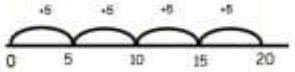
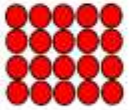
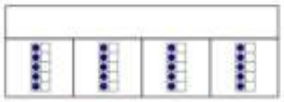
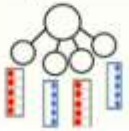
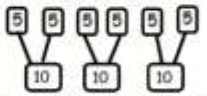
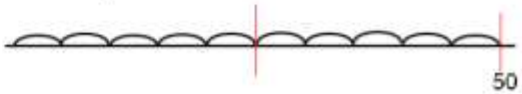
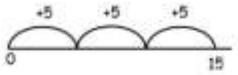
5x Table: Relationship Between Repeated Addition and Skip Counting

Notes	Concrete	Visual to Support Abstract
Make the point that recording and reading repeated addition calculations is time consuming, so we can refer to them as 'lots of' 10. Ensure examples which include multiplying by 1 and 0 are included.	Give real life problems involving repeated addition of five and use apparatus to act out the problem and solve. Draw to show understanding.  Write a repeated addition to show this. How else could we say it? 5+5+5+5+5+5= or 6x5. Can you show this with concrete equipment, e.g. coins? Place cubes in fives over a 100 square. What do you notice? Place cubes along a counting stick and count in fives.  Model and write repeated addition and multiplication. Show how these can be represented as jumps on a number line. Use counting stick methods (see page 7) to explore the relationships between multiples of 5 and to find more efficient ways to derive them using underlying skills and known facts. What do you think 11x5 would be? 12x5? How do you know? Make sure the relationship of x9 to tenth multiple is focused upon particularly and discuss whether this strategy would work for other multiples. E.g. How could you find 9x3? 9x4? The counting stick can also be linked to reading scales in fives and finding missing numbers. What is the missing number? How did you find it? Did anyone find it a different way? 	Represent repeated addition, multiplication and division calculations in a variety of ways (see examples for x2 on page 30). Match calculations to arrays, bar models, part-whole models and number lines and vice versa.  Write the repeated addition and multiplication that these show. Write the 2 division calculations that they show. Use to find missing numbers, e.g. __x5=20. Write a problem that the visual shows or to match a calculation.  Colour a 100 square to show the pattern of fives. What do you notice? Record and solve calculations and problems on an empty number line. 

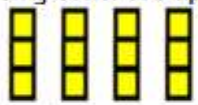
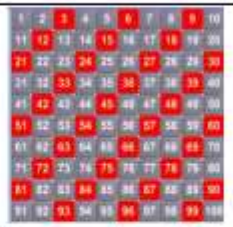
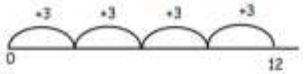
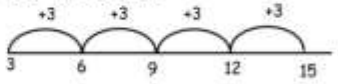
Year 2 Reception Maths Long Term Plan 2022-2023

5x Table: Investigating Relationships.

Notes	Concrete	Visual to Support Abstract
It is important to exploit doubling and halving knowledge to investigate the relationship between the fives and the tens. Use language related to scaling, e.g. 5 times as much/many, 5 times greater and give practical problems including these. When looking at multiplication, ask what it could mean. E.g. 5x6 could be: 5 lots of 6, 6 lots of 5, 5 six times, 6 five times, 6 multiples of 5, 5 multiples of 6,5+5+5+5+5+5, 6+6+6+6+6 etc.	Make arrays (see page 21) to show different multiplication/repeated addition and division calculations. Use these to illustrate the commutative property. E.g. Discuss how it can show both 5x4 and 4x5, 5+5+5+5 or 4+4+4+4+4. Match calculations to concrete representations.  Extension: What else could it show? (2x10, 3 fives and another five). Show me two fives and another two fives. How many fives have you got?   Investigate the commutative property. Make a bar model to show 4x5. Now make one to show 5x4. What's the same and what's different? Make up a problem for each. Investigate the relationships between tens and fives practically and combine in part-whole models and bar models. Play as a game. Show 3 lots of 10. Predict how many lots of 5? How many will there be in 4 tens? Prove it using cubes, tens frames and other number equipment. Show it on a 100 square. 2 lots of 10. How many lots of 5?   Explore the relationship between 10x and 5x on a counting stick, putting concrete apparatus along the stick.  If 10x5=50, what is 5x5? What if it were 10x2? 10x10?	Draw and group arrays to show different multiplication and repeated addition calculations. E.g. 5x4, 4x5, 5+5+5+5 or 4+4+4+4+4. Also, link arrays to division. Make the link between the fives and the tens.  3x10= __x5. 10x5=50, what is 5x5?  What tables fact does the number line show? How can it help you to find 6x5? What do you think 12x 5 would be?  This shows 3x5. Predict 6x5. Draw a number line to show 3x5+3x5. True or false? 6x5>2x5. 4x5> 4x2. Explain how you know. How many different ways can you find the answer to 8x5? (Discuss the different ways to help children understand the relationships within multiplication tables, e.g. count in fives, or 8+8+8+8+8 using doubles and addition, or ten fives subtract two fives or double four fives).

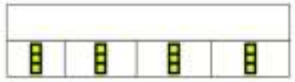
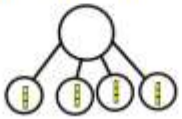
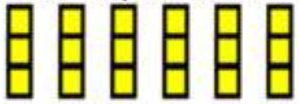
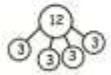
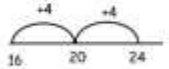
Year 2 Reception Maths Long Term Plan 2022-2023

3x Table: Relationship Between Repeated Addition and Skip Counting

Notes	Concrete	Visual to Support Abstract
Although the 3x table is covered in Year 3, counting in threes is covered in Year 2 and there have been questions on Year 2 SATs papers testing the 3x table. Therefore, it makes sense to cover it in Year 2 and revise it in Year 3. Ensure examples which include multiplying by 1 and 0 are included.	Represent and solve problems involving repeated addition of three using concrete apparatus.  Write a repeated addition to show this. How else could we say it? 3+3+3+3 = or 4x3= Can you show this with cubes? Place cubes/number pieces/Cuisenaire rods along a counting stick and mark in threes.  Use counting stick methods (see page 7) to explore the relationships between multiples of 3 and find more efficient ways to derive them using underlying skills and known facts. What do you think 11x3=? 12x3? How can 10x3 help you find 5x3? 9x3? Make sure the relationship between the ninth and tenth multiple is focused upon particularly and discuss whether this strategy would work for other multiples. E.g. Could you use it for 9x4? 9x6? Model and write repeated addition and multiplication calculations. Begin to derive the division facts using counting stick. E.g. How many threes in 15? Use an empty counting stick to link facts together and revise other tables. E.g. Point to the tenth multiple and ask if this is 30, what would 9x be? What about if the tenth multiple was 50? 100? 20?	 Colour a 100 square to show the pattern of threes. Can you spot any patterns? Use counting stick relationships to find missing numbers on empty number lines. Draw number lines to solve calculations and problems. What tables fact does the number line below show? Can you use this to find 8x3? Rory says it also shows 2x3+2x3. Is he right?  Match repeated addition and multiplication calculations to number line visuals and vice versa. Make up a problem that a calculation or visual could show. Gemma drew this number line to show 4x3. What is her mistake? 

Year 2 Reception Maths Long Term Plan 2022-2023

3x Table: Investigating Relationships.

Notes	Concrete	Visual to Support Abstract
Use language related to scaling as well as skip counting. E.g. 4x3 can be 4 lots of 3 or 4 three times or triple four. Tripling is important, as it helps to show the commutative property and encourages children to think about tables fact from different perspectives.	Make arrays (see page 21) to show different multiplication/repeated addition calculations. Use them to discuss the commutative property. E.g. Discuss how it can show both 6x3 and 3x6, 6+6+6 or 3+3+3+3+3+3. Match calculations to concrete representations and to visuals. What division facts can you work out?  Extension: What else could it show? (2x9, 9x2). Show me threes threes and another three threes. How many threes have you got? How could we write a calculation to show this?   Make a bar model/part whole model to show 4x3. How many parts will you have? How many in each part? What will the whole be? Now make one to show 3x4. What's the same? What's different? Can you make up a problem for each representation? Can you use the bar model above to help you work out 8x3? 2x3? What would your bar model look like if you wanted to show 4 three times/three times as many? Investigate relationships practically with discussion and prediction of what will happen when numbers are changed, doubled etc. Combine in part-whole models and bar models practically.  Show 6 lots of 3. Predict 12 lots of 3, 3 lots of 3? Prove it using concrete equipment. Show it on a 100 square/counting stick/ number line.	Show 3x4 In an array | In a bar model In a part whole model | On a number line   Use visuals to solve missing number problems and investigate the relationship between multiplication and division. Write multiplication and division sentences represented by visuals. What do you notice: 2x3=6 4x3=12 Which calculation would come next? Explain. Show a calculation. What could it mean? E.g. 3x8 – 8 lots of 3, 3 lots of 8, 8 three times, 3 eight times, 3 multiples of 8 etc. Discuss different ways to solve. Practise tripling, which makes use of doubling and bridging. E.g. e.g. 3x8 - 8+8+8 16 +8 
Reasoning	• True or false: 6x3>2x3. Explain how you know. • 3x10> _____. What could go there? What couldn't go there? • 3x3 _____ 7x3? Which of these could not go in the middle: 5x3, 3x4, 3x2. Explain how you know.	

Waltham-on-the-Wolds CE Primary School

'Let your light shine' Matthew 5:16

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