Waltham-on-the-Wolds CE Primary School

'Let your light shine' Matthew 5:16

Year 3/4 Reception Maths Long Term Plan 2022-2023

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'Let your light shine' Matthew 5:16

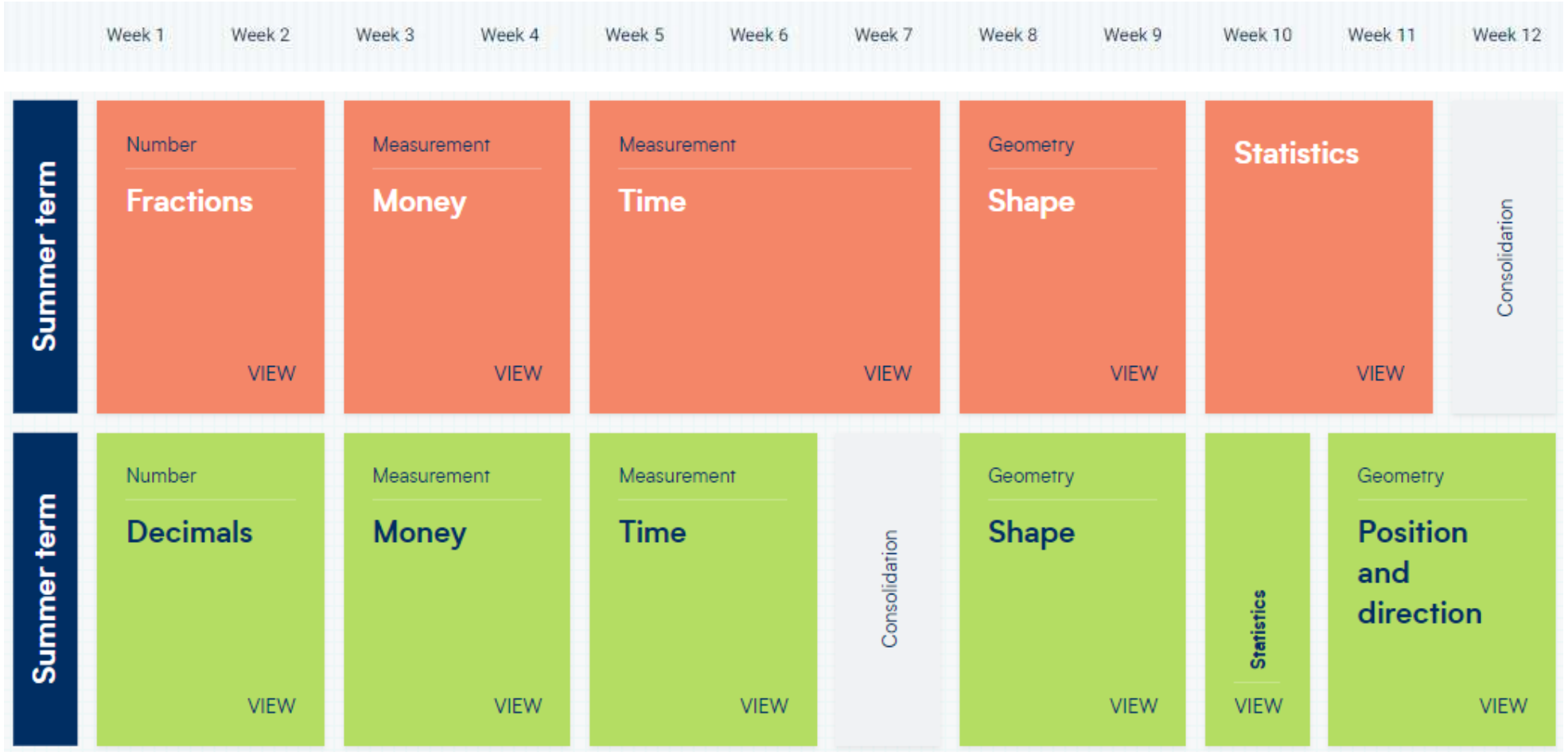
Year 3/4 Reception Maths Long Term Plan 2022-2023

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Spring term	Number **Multiplication and division** VIEW			Measurement **Length and perimeter** VIEW			Number **Fractions** VIEW			Measurement **Mass and capacity** VIEW		
Spring term	Number **Multiplication and division** VIEW			Measurement **Length and perimeter** VIEW			Number **Fractions** VIEW			Number **Decimals** VIEW		

Waltham-on-the-Wolds CE Primary School

'Let your light shine' Matthew 5:16

Year 3/4 Reception Maths Long Term Plan 2022-2023



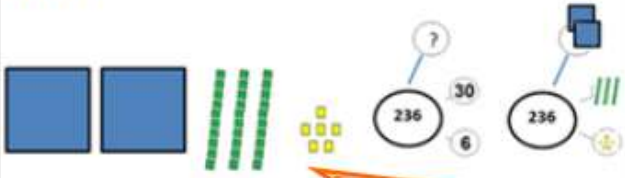
Year 3/4 Reception Maths Long Term Plan 2022-2023

Number and Place Value

Core concept: UNITISING and PLACE VALUE

Core skill: REGROUPING

Grouping hundreds, tens and ones drawing out the concept that ten ones are equal to a unit of one ten and that ten tens are equal to a unit of one hundred.



I can see 2 hundreds, 3 tens and 6 ones
200 + 30 + 6.
236 is also six more than two hundred and thirty.

Using part part whole models, regroup 3-digit integers flexibly and in multiple ways.

236 can be regrouped into 220 and 16.
There are 23 tens and 6 ones in 236.

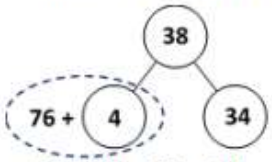
Addition and Subtraction

Core concept: CONSERVATION

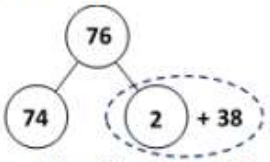
Core skill: REGROUPING

Think regroup for addition
Using part whole models draw out the skill of regrouping numbers to allow bridging through multiples of ten and a hundred. Ask pupils to reason why they may wish to reorder the numbers.

Pupils should be encouraged to explore multiple ways of regrouping both addends (refer to number and place value experiences). Only a limited example is shown here e.g. 76 + 38

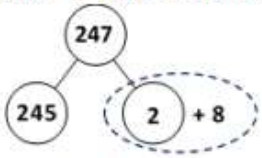


76 + 38 = 80 + 34

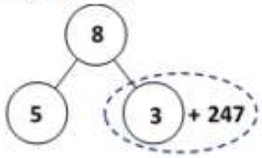


76 + 38 = 74 + 40

This can be applied to regrouping addends in 3-digit + 1-digit calculations e.g. 247 + 8.



247 + 8 = 245 + 10



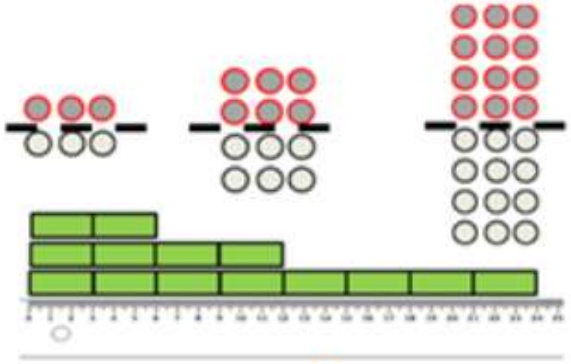
247 + 8 = 250 + 5

Multiplication and Division

Core concept: UNITISING and SCALING

Core skill: DOUBLING and HALVING

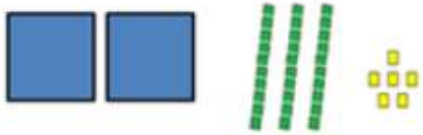
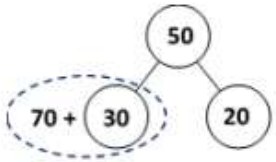
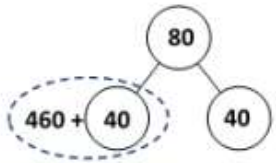
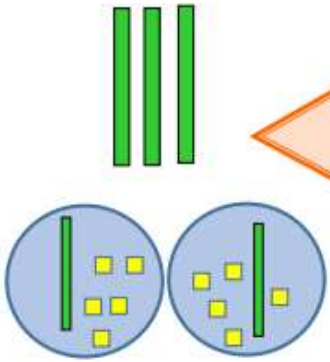
To include 'double and double' strategy for x8 and halving strategy for finding x5.



I can find 5 lots by finding 10 lots and halving the product.

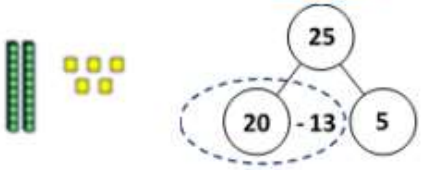
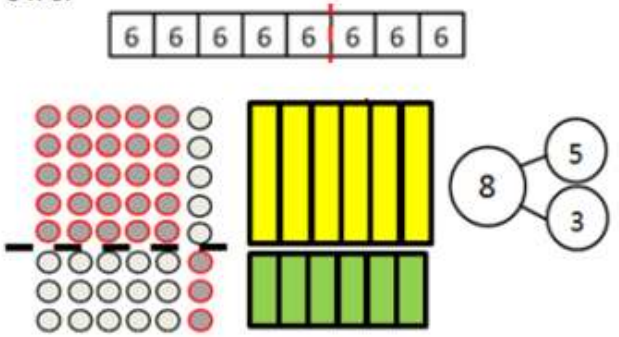
Year 3
Numbers to 1000

Year 3/4 Reception Maths Long Term Plan 2022-2023

Number and Place Value	Addition and Subtraction	Multiplication and Division
Repeat this understanding to explore tenths through the same concrete and pictorial representations securing the multiplicative relationship.  3 ones and 4 tenths.  2 tens, 3 ones and 6 tenths.	This can also be applied to regroup to bridge through multiples of 100 e.g. 70 + 50 or 460 + 80.  70 + 50 = 100 + 20  460 + 80 = 500 + 40 This sum is easier if I regroup the 80 into 40 and add it to the 460 to make 500.	Ensure pupils can double and halve 2-digit numbers and generalise what happens when we halve a number with an odd multiple of tens.  If I halve 30, I can share one ten into each group but then I have to regroup the last ten into ten ones. Each group will then get five ones. So 1 ten and 5 ones in each group is 15. Extend to halving odd multiples of 100 and later odd ones. Pupils should also be able to use doubles knowledge to solve near double questions e.g. 70 + 60. 70 + 60 is like double 60 plus 10. It's also 10 less than double 70.

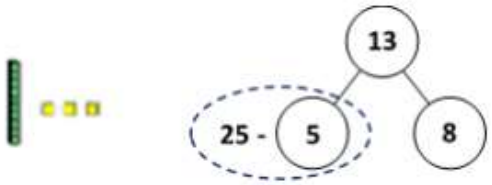
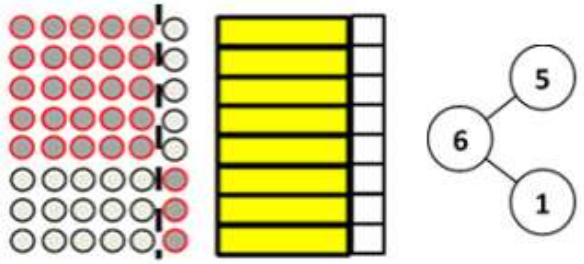
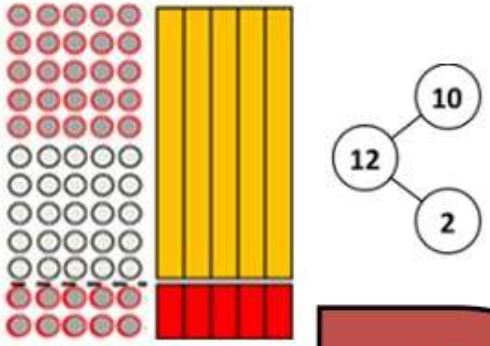
Year 3
Numbers to 1000

Year 3/4 Reception Maths Long Term Plan 2022-2023

Number and Place Value	Addition and Subtraction	Multiplication and Division
	Core concept: UNITISING **Core skill: REGROUPING** **Think Regroup for subtraction** drawing out the skill of regrouping either the minuend or subtrahend including when bridging through multiples of ten and a hundred e.g. 25 - 13. **Regrouping the minuend** I regrouped the 25 into 20 and 5. Then I took the 13 from the 20 and that left 7. Now I add that to the 5 which makes 12.   I regrouped the 25 into 23 and 2. Then I took the 13 from the 23 and that left 10. Now I add that to the 2 which makes 12.	**Core concept: CONSERVATION** **Core skill: REGROUPING** **Think 5x fact** Application of the distributive law. Regrouping the multiplier (number of groups) e.g. 8 x 6.  8 x 6 = 5 x 6 + 3 x 6 I can use my 5 fact to solve 8 x 6. I know 5 x 6 is 30 and 3 x 6 is 18. So 8 x 6 is 48.

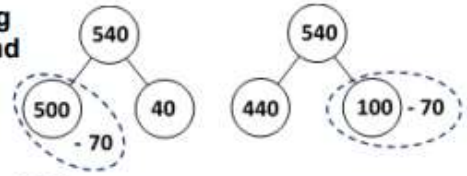
Year 3
Numbers to 1000

Year 3/4 Reception Maths Long Term Plan 2022-2023

Number and Place Value	Addition and Subtraction	Multiplication and Division
	Regrouping the subtrahend  I regrouped the 13 into 5 and 8. Then I took the 5 from the 25 and that left 20. Now I can take away the remaining 8 to make 12.	Regrouping the multiplicand (number in the group) e.g. 8 x 6.  8 x 6 = 5 x 8 + 1 x 8 I can use my 5 fact to solve 8 x 6. I know 8 x 5 is 40 and 8 x 1 is 8. So 8 x 6 is 48. Applying to **think 10**. For example, 12 x 5.  12 x 5 = 10 x 5 + 2 x 5

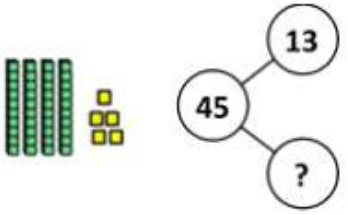
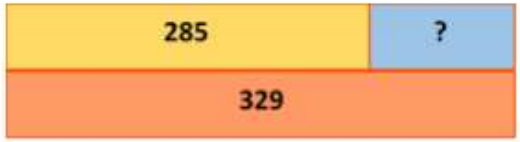
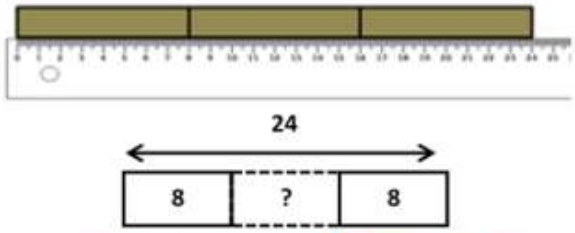
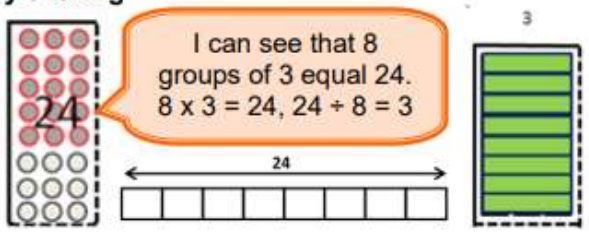
Year 3
Numbers to 1000

Year 3/4 Reception Maths Long Term Plan 2022-2023

Number and Place Value	Addition and Subtraction	Multiplication and Division
	Then applied to HTO - O and HTO - TO. For example, 540 - 70. **Regrouping the minuend**   **Regrouping the subtrahend** Apply to contexts of measures such as money and time e.g. £3 and 40p subtract 60p I can regroup the 60p into 40p and 20p. First, I take the 40p away. That gets me to £3. Next, I take the 20p away, which is £2 and 80p. **Core concept: UNITISING** **Core skill: FINDING COMPLEMENTS / REORDERING** **Reordering and finding complements** Adding three or more numbers. Draw out reasons why children may wish to reorder the numbers. Focus upon the range of strategies used. 6 + 9 + 4 + 5 + 1 = 75 + 95 + 25 = 1.5 + 3 + 0.5 =	

Year 3
Numbers to 1000

Year 3/4 Reception Maths Long Term Plan 2022-2023

Number and Place Value	Addition and Subtraction	Multiplication and Division
	Core skill: APPLYING THE INVERSE **Think addition for subtraction**  45 - ☐ = 13 13 + ☐ = 45 Thirteen and what makes 45?  329 - 285 = ☐ so 285 + ☐ = 329	**Core skill: APPLYING THE INVERSE** **Think multiplication for division** e.g. 24 ÷ 8 **By grouping**  I can see that 3 groups of 8 equal 24. 3 x 8 = 24, 24 ÷ 8 = 3 **By sharing**  *Leading to fractional understanding – see Year 2 progression and extend into further fractions.* **Year 3 Numbers to 1000**

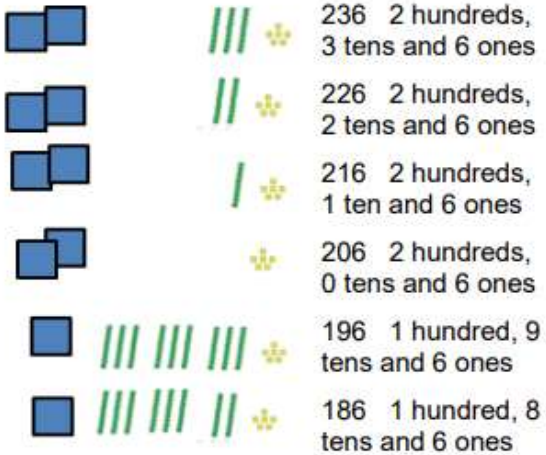
Year 3/4 Reception Maths Long Term Plan 2022-2023

Number and Place Value

Core concept: COUNTING and PLACE VALUE

Core skill: COUNTING ON and BACK

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

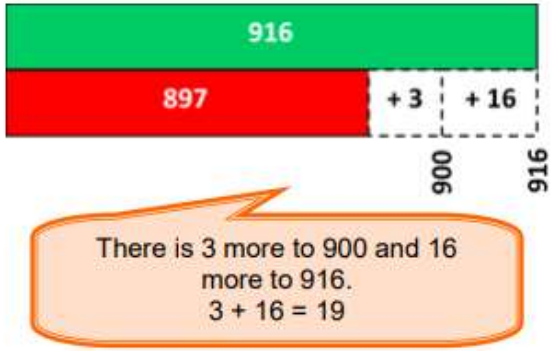


Addition and Subtraction

Core concept: COMPARISON

Core skill: COUNTING ON and BACK

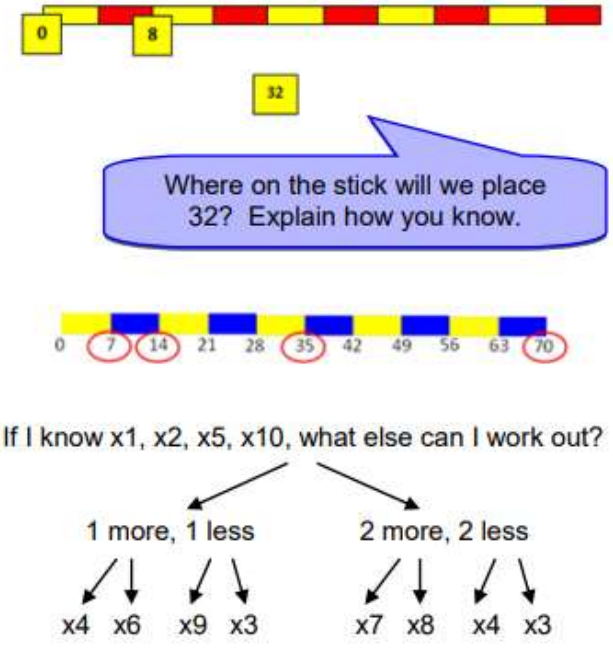
Count on to find the difference drawing out the use of complements to benchmark numbers e.g. 916 – 897.



Multiplication and Division

Core concept: UNITISING and SCALING

Core skill: COUNTING ON and BACK



Year 3 Numbers to 1000

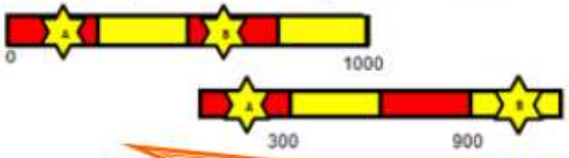
Year 3/4 Reception Maths Long Term Plan 2022-2023

Number and Place Value

Core concept: MAGNITUDE and COMPARISON

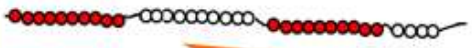
I can find 236cm on my tape measure. It is 36cm greater than 200cm and 64cm less than 300cm.

Number magnitude drawing out the concepts of relative size, order and comparison of number.



I think that number A is 200 because it is nearly 250.

Estimation drawing out concepts of distance of numbers to target numbers to prepare for rounding.

200 and 

234 is 4 from 230 and 6 from 240. 234 is nearer to 230 than to 240.

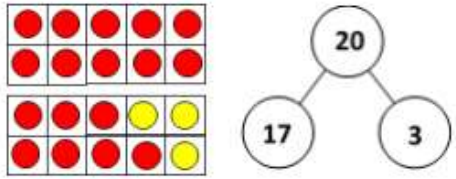
Addition and Subtraction

Core concept: COMPARISON

Core skill: COMPENSATION

Part whole model

45 - 17



45 - 17

= 45 - 20 + 3
= 25 + 3
= 28

Subtracting 17 is the same as subtracting 20 and adding 3 back.

Multiplication and Division

Core concept: COMPARISON and SCALING

Core skill: COMPENSATION

9 x 3 = 10 x 3 - 3

9 x 3 = 10 x 3 - 1 x 3

Nine groups of three is equal to 10 groups of three, less 1 group of 3.

Year 3 Numbers to 1000

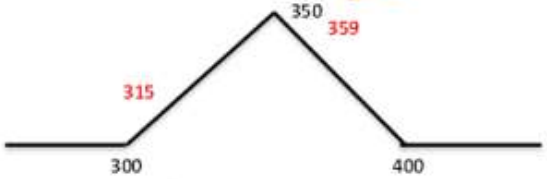
Year 3/4 Reception Maths Long Term Plan 2022-2023

Number and Place Value

Core skill: ROUNDING

Leading to rounding to the nearest 10, the nearest 100 and, later, the nearest 1.

359 is nearer to 400 than 300 so it rounds to 400.



315 is nearer to 300 than 400 so it rounds to 300.

Addition and Subtraction

Core concept: COMPARISON

Core skill: COMPENSATION

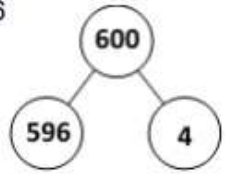
£3 and 40p add 80p

£3 and 40p

£3.40 + £1 - 20p
= £4.40 - 20p
= £4.20

Adding 80p is the same as adding £1 and subtracting 20p.

632 - 596

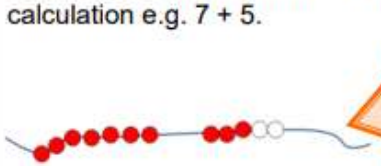
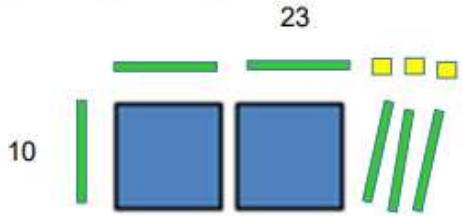


Subtracting 596 is the same as subtracting 600 and adding 4 back.

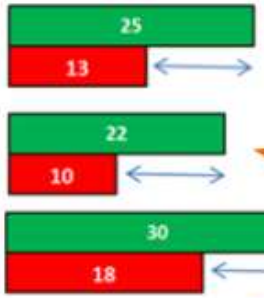
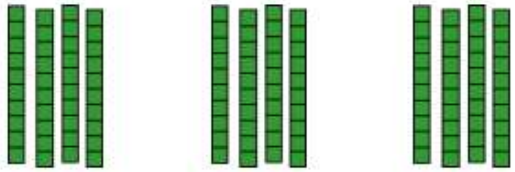
Multiplication and Division

Year 3
Numbers to 1000

Year 3/4 Reception Maths Long Term Plan 2022-2023

Number and Place Value	Addition and Subtraction	Multiplication and Division
	Core concept: CONSERVATION and SUM **Core skill: REBALANCING** **Equal sum** drawing out the idea of equality when we rebalance the numbers in an addition calculation e.g. 7 + 5.  e.g. 52 + 37  52 + 37 I move 2 beads from the 52 and give them to the 37. Now I can solve 50 + 39. It's easier.	**Core concept: PLACE VALUE and SCALING** **Core skill: x ÷ BY 10** **Check pupils understand the concept of multiplying and dividing by 1 and 0.** **Place value** drawing out the implications of multiplying and dividing by ten and 100 on 2-digit numbers e.g. 23 x 10.  23 groups of ten. 20 groups of ten is equal to 200. 3 groups of ten is equal to 30. 23 groups of 10 is equal to 230. **Year 3 Numbers to 1000**

Year 3/4 Reception Maths Long Term Plan 2022-2023

Number and Place Value	Addition and Subtraction	Multiplication and Division
	Core concept: COMPARISON **Core skill: REBALANCING** **Equal difference using comparison** drawing out the concept that adding or subtracting the same quantity from both the subtrahend and minuend maintains the difference between the numbers.  I can take 3 from each number and the difference will remain equal. I can add 5 to each number and the difference will remain equal. If I wanted to solve 21 - 16, I can take 1 from each number and solve it as 20 - 15. That is an easier calculation.	☐ = 3 x 40  3 groups of 4 tens is equal to 12 tens. 12 tens is 120. So 120 = 3 x 40 ☐ = 120 ÷ 3 120 is 12 tens. 12 tens divided into 3 groups is equal to 4 tens. 4 tens is 40. So 40 = 120 ÷ 3. **Year 3 Numbers to 1000**

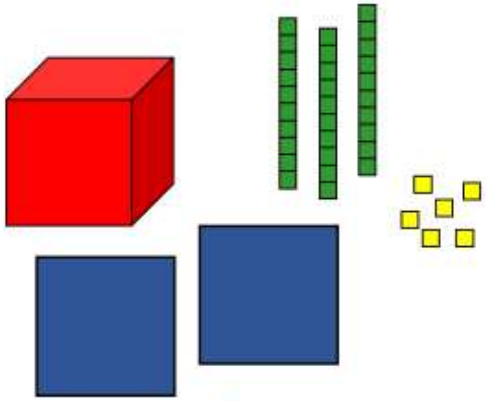
Year 3/4 Reception Maths Long Term Plan 2022-2023

Number and Place Value

Core concept: UNITISING

Core skill: REGROUPING

Grouping thousands, hundreds, tens and ones drawing out the concept that ten ones are equal to a unit of 'one ten' and ten tens are equal to a unit of one hundred etc.



I can see one thousand, two hundreds, three tens and six ones.
1000 + 200 + 30 + 6
It is thirty-six more than one thousand and two hundred.

Addition and Subtraction

Core concept: UNITISING

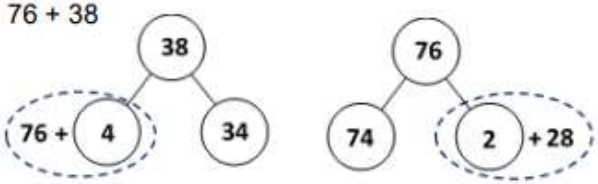
Core skill: REGROUPING

Think Regroup for addition

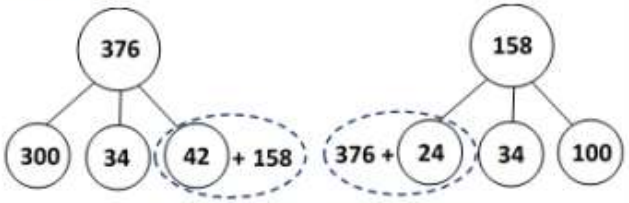
Part whole drawing out the concept of regrouping numbers to allow bridging through hundreds, tens and ones. Ask pupils to reason why they may wish to reorder the numbers.

Pupils should continue Year 3 learning and be encouraged to explore multiple ways of regrouping both addends (refer to number and place value experiences). Only a limited example is shown here.

76 + 38



This can be adapted to 'Think 100'
376 + 158



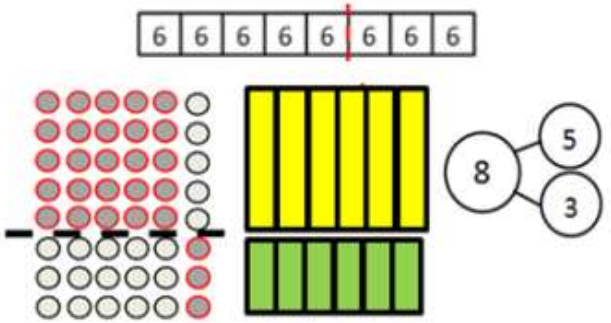
Multiplication and Division

Core concept: CONSERVATION and SCALING

Core skill: REGROUPING

Think 5x fact
Application of the distributive law

Regrouping the multiplier (number of groups).
For example, 8 x 6.



I can use my 5 fact to solve 8 x 6.
I know 5 x 6 is 30. 3 x 6 is 18.
So 8 x 6 is 48.

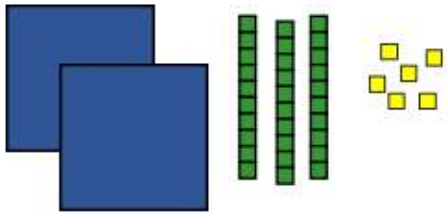
8 x 6 = 5 x 6 + 3 x 6

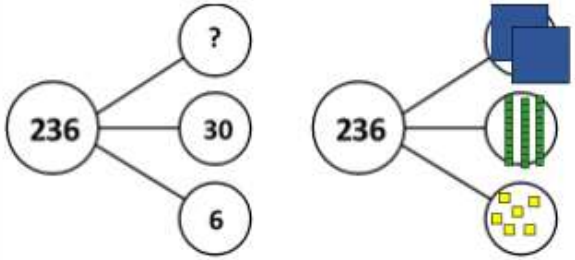
Year 4
Numbers to 10000

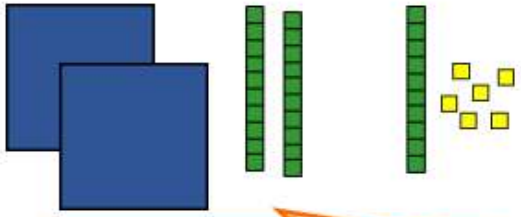
Year 3/4 Reception Maths Long Term Plan 2022-2023

Number and Place Value

Part part whole
Regroup 3-digit and 4-digit integers flexibly and in multiple ways.







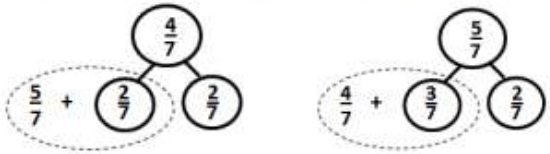
236 can be regrouped into 220 and 16.

Addition and Subtraction

Adapt '**Think Regroup**' strategy to decimal and fractional part whole as well as measures such as time and money.

For example: $\frac{4}{7} + \frac{5}{7} =$

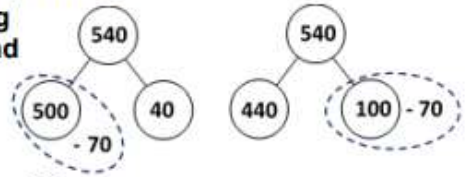
Both addends can be regrouped using complements to 1 and '*some more*'.

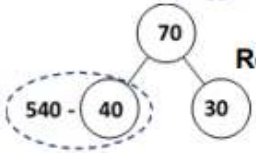


Think Regroup for subtraction

Part whole drawing out the skill of regrouping either the minuend or the subtrahend.
Pupils should be encouraged to explore multiple ways of regrouping both the minuend and subtrahend (refer to number and place value experiences).
For example, 540 - 70.

Regrouping the minuend

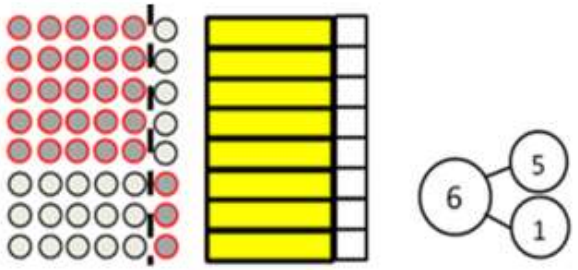




Regrouping the subtrahend

Multiplication and Division

Regrouping the multiplicand (number in the group) e.g. 8 x 6.



I can use my 5 fact to solve 8 x 6.
I know 8 x 5 is 40. 8 x 1 is 8.
So 8 x 6 is 48.

8 x 6 = 8 x 5 + 8 x 1

Regrouping used for multiple strategies.

7 x 8

I can find 7 x 8 in lots of ways if I didn't know it.
I can try 7 x 4 x 2 or 8 x 8 - 8.

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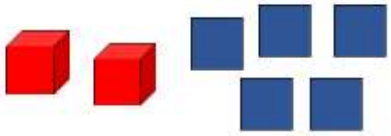
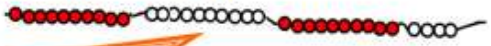
Number and Place Value

Use resources to prove statements such as:
'There are 25 hundreds in the number 2500'.



Continue this to explore tenths and hundredths through the same concrete and pictorial representations to secure understanding of the multiplicative relationship.



I can see three tenths and four hundredths.

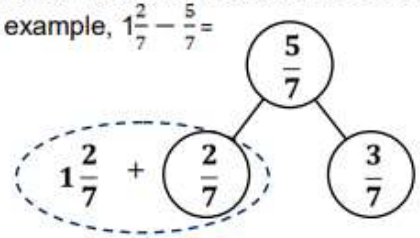
I can see that in the number 25.36, there are 2 tens, 5 ones, 3 tenths and 6 hundredths.

We can also say there are 253 tenths and 6 hundredths in my number.

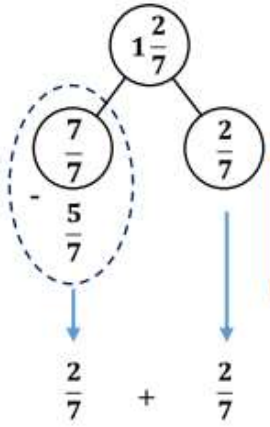
Addition and Subtraction

Then adapted to decimal and fractional part whole as well as measures such as time and money.

For example, $1\frac{2}{7} - \frac{5}{7} =$



I can regroup the subtrahend $\frac{5}{7}$ into $\frac{2}{7}$ and $\frac{3}{7}$. Then I can take away the $\frac{2}{7}$ leaving $\frac{7}{7}$ or 1 and finally take away $\frac{3}{7}$.



... or I could regroup the minuend, subtract from the 1 and then recombine.

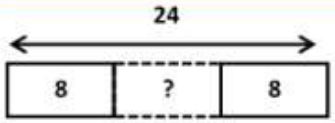
Multiplication and Division

Core skill: APPLYING THE INVERSE

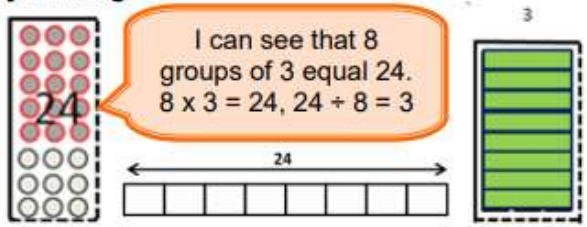
Think multiplication for division
For example, 24 ÷ 8.

By grouping

I can see that 3 groups of 8 equal 24.
3 x 8 = 24, 24 ÷ 8 = 3



By sharing



I can see that 8 groups of 3 equal 24.
8 x 3 = 24, 24 ÷ 8 = 3

Leading to fractional understanding – see Year 2 progression and extend into further fractions.

Year 4
Numbers to 10000

Year 3/4 Reception Maths Long Term Plan 2022-2023

Number and Place Value

Core concept: COMPARISON

Core skill: COUNTING ON and BACK

Counting on and back in hundreds and tens from any number. Allow pupils to notice the pattern. What changes as a result and what does not.

Counting on and back in multiples as well as making counting links e.g. counting in 6s, 60s (relate to time), 600s and 0.6s.

Counting in 25s, 50s, 0.1s and 0.01s paying attention to bridging (regrouping) points.

Addition and Subtraction

Core concept: COMMUTATIVTY and UNITISING

Core skill: REORDERING and FINDING COMPLEMENTS

Adding three or more numbers. Draw out the reasons why pupils may wish to reorder the numbers and focus on a range of strategies used.

800 + 240 + 360 =
2.5 + 25 + 5 + 2.5 =
310 + 700 + 300 =

Core concept: COMPARISON and DIFFERENCE

Core skill: COUNTING ON and BACK

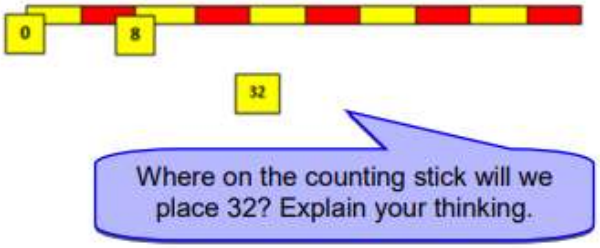
916 – 897

Comparison
Drawing out use of benchmark numbers.

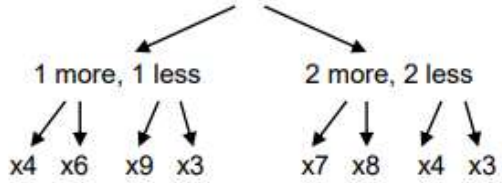
Multiplication and Division

Core concept: UNITISING and SCALING

Core skill: COUNTING ON and BACK



If I know x1, x2, x5, x10, what else can I work out?



Year 4 Numbers to 10000

Year 3/4 Reception Maths Long Term Plan 2022-2023

Number and Place Value

Core concept: MAGNITUDE

Number magnitude drawing out the concepts of relative size, order and comparison of number.

The number couldn't be…because ….
It could be … because…

Number estimation (using scales) should be applied to different scales of measures. This should include those with negative and dial scales.

Core skill: ROUNDING

Leading to rounding to the nearest 10, 100, 1000, hour and £1 etc.

Addition and Subtraction

Core concept: COMPARISON, SUM and DIFFERENCE

Core skill: COMPENSATION and REBALANCE

Equal sum drawing out the concept of equality when rebalancing the numbers in an addition calculation.

255 + 49 is easier if I take one from the 255 and give it to the 49. My sum stays equal. Then my sum becomes 254 + 50 = 304.

Compensation with the same calculation supports pupils' multi-strategy approach. Pupils can begin to evaluate strategies.

I could also think of 255 + 49 as compensation because adding 49 is like adding 50 and taking one away. Now my sum looks like this: 255 + 50 - 1 = 304.

Multiplication and Division

Core concept: COMPARISON and SCALING

Core skill: COMPENSATION

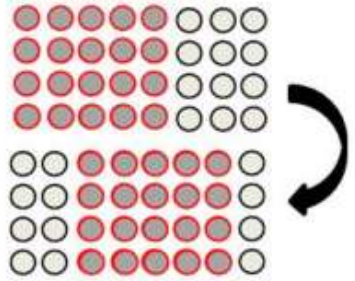
3 x 9 = 3 x 10 - 3

Nine groups of three is equal to ten groups of three, less 1 group of 3.

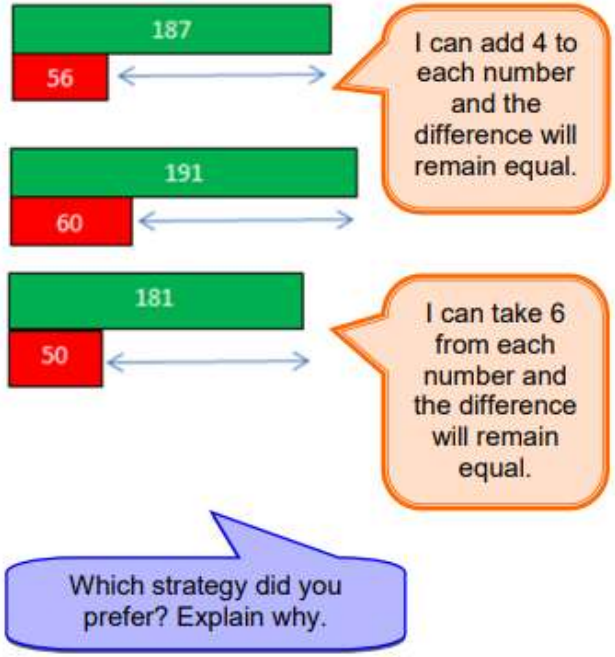
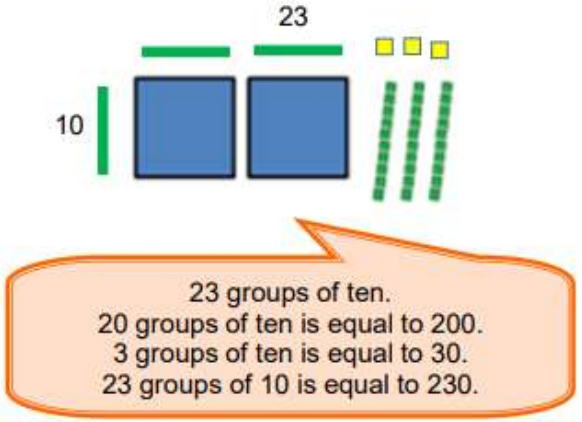
I could use this to find 90 x 3.
100 x 3 - 10 x 3

Year 4
Numbers to 10000

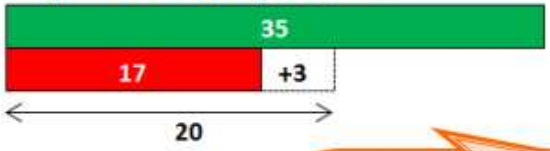
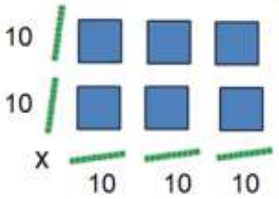
Year 3/4 Reception Maths Long Term Plan 2022-2023

Number and Place Value	Addition and Subtraction	Multiplication and Division
	Rebalancing  It is 1.44pm. What time will it be in 50 minutes? 10 minutes 1 hour 44 minutes + 50 minutes = 1 hour 34 minutes + 60 minutes = 2 hours and 34 minutes = 2.34pm If I give 10 minutes from the 1 hour 44 to the 50 minutes then I can add on 1 hour. **Compensation**  It is 1.44pm. What time will it be in 50 minutes? Adding 50 minutes is like adding one hour and taking away 10 minutes.	**Core concept: CONSERVATION and SCALING** **Core skill: REARRANGING** Children should explore **rearranging** arrays to simplify multiplications but conserve the area. 4 x 16 =  Can become 8 x 8  Doubling the 4x and halving the group of 16 gives me 8 x 8. The area remains equal. **Year 4 Numbers to 10000**

Year 3/4 Reception Maths Long Term Plan 2022-2023

Number and Place Value	Addition and Subtraction	Multiplication and Division
	Equal difference using comparison drawing out the concept that adding or subtracting the same quantity from both the subtrahend and minuend maintains the difference between the numbers. 	**Core concept: PLACE VALUE** **Core skill: x ÷ BY 10, 100** **Check pupils understand the concept of multiplying and dividing by 1 and 0.** **Place value** drawing out the implications of multiplying and dividing by 10 and 100 on 2-digit numbers e.g. 23 x 10.  **Year 4 Numbers to 10000**

Year 3/4 Reception Maths Long Term Plan 2022-2023

Number and Place Value	Addition and Subtraction	Multiplication and Division
	I had £35. I bought a book for £17. How much change do I get?   I can take 5 from each number and the difference will remain equal. Compare this to **compensation**.  Subtracting £17.00 is like subtracting £20.00 and adding back £3.00.	□ = 3 x 40  3 groups of 4 tens is equal to 12 tens. 12 tens is 120. So 120 = 3 x 40. □ = 120 ÷ 3 120 is 12 tens. 12 tens divided into 3 groups is equal to 4 tens. 4 tens is 40. So 40 = 120 ÷ 3. 20 x 30 = □  When I multiply 10 by 10 it equals 100. 2 tens multiplied by 3 tens is equal to 6 hundreds. **Year 4** **Numbers to 10000**

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'Let your light shine' Matthew 5:16

Year 3/4 Reception Maths Long Term Plan 2022-2023

Lower KS2 examples

'Think Regroup' for addition

Think 10

37 + 45 68 + 23 29 + 75
76 + 27 55 + 16 42 + 38
537 + 8 727 + 5 213 + 18 146 + 37
36 - □ = 29 56 - 2□ = 33 □7 – 45 = 32

Think 100

290 + 13 370 + 50 580 + 73
270 + 51 67 + 350 860 + 69
86 + 770 680 + 63

Think 1000

4900 + 500 4800 + 260 6900 + 430
3200 + 910 230 + 7900 570 + 8500
3700 + 370 3622 + 500

Think 1

2.7 + 1.4 $2\frac{8}{10} + \frac{3}{10} =$ 6.5 + 5.6

$1\frac{7}{8} + 1\frac{5}{8}$

'Think Regroup' for subtraction

Think 10

97 - 8 74 - 7 53 - 5 63 - 37
77 - 32 84 - 26 57 - 28 256 - 37
25 + □ = 85 163 + □ = 363 426 + 2□2 = 668

Think 100

230 - 70 660 - 82 420 - 77 950 - 147

Think 1

1.3 - 0.6 $1\frac{4}{8} - 1\frac{5}{8}$ 3.4 - 2.7 $2\frac{1}{3} - 1\frac{2}{3}$

Re-ordering and finding complements

Complements to 10

8 + 6 + 2 + 3 + 4 3 + 5 + 7 + 5 +4
1 + 4 + 6 +7 + 9 30 + 50 + 70
25 + 50 + 5 75 + 40 + 20 + 25

Complements to 100

400 + 547 + 600 700 + 240 + 300
750 + 400 + 250

Complements to 1

2.7 + 4 + 1.3 4.6 + 5 + 2.4 8.2 + 3 + 5.8

Compensation

42 + 29 45 + 27 24 + 47 28 + 65 68 + 27
232 + 49 856 + 17 48 + 325 232 + 95
132 + 59 568 + 195 399 + 423 412 + 298
405 + 199 597 + 308
43 - 18 94 - 37 54 - 29 77 - 9 82 - 23
483 - 99 256 - 98 398 - 74 597 - 63
401 - 97 736 - 301 613 - 299 743 - 397
298 - 156 799 - 403

Rebalancing - Equal sum

45 + 27 26 + 39 78 + 18 65 + 27
73 + 39 84 + 47 42 + 97 116 + 35
368 + 123 404 + 198 356 + 427 528 +298
3.7 + 1.9 7.6 + 4.7 1.9 + 5.8

Rebalancing - Equal difference

75 - 28 56 - 29 78 - 38 55 - 27
83 - 21 75 - 12 95 - 42 67 - 51
912 - 797 837 - 498 711 - 467 628 -198
482 - 302 729 - 404 548 - 202 637- 203
6.4 - 3.9 6.6 - 3.2 7.7 - 4.8 $1\frac{2}{7} - \frac{5}{7}$

Counting on to subtract

315 - 298 412 - 396 917 - 898 611 - 598

Think multiplication

85 ÷ 5 72 ÷ 4 99 ÷ 6 240 ÷ 12
660 ÷ 3 210 ÷ 7 540 ÷ 9 500 ÷ 4
□ ÷ 3 = 8 3□ ÷ 5 = 6

X and ÷ 10, 100 and 1000

4 x 30 9 x 30 70 x 70 60 x 50
300 x 4 800 x 7 9 x 800 6 x 400
3 x 2000 4000 x 6 8 x 7000 9 x 8000
500 ÷ 10 400 ÷ 5 600 ÷ 2 240 ÷ 4
120 ÷ □ = 12 365cm = □ m 750mm = □ cm

Double and near double facts

7 x 20 3 x 38 9 x 200 11 x 4
16 x 20 18 x 2000
80 ÷ 4 160 ÷ 4 1600 ÷ 4 2400 ÷4

Think 5 / Think 10 for multiplication

28 x 5 16 x 8 23 x 9 92 x 8 52 x 4
13 x 21 34 x 19 123 x 4 214 x 6 9 x 234
11 x 314 21 x 400 400 x 38

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Year 3/4 Reception Maths Long Term Plan 2022-2023

Key facts	
Year Three Recall • Sums and differences between pairs of numbers which are multiples of 10 and 100 • Doubles and halves of multiples of 10 or 100 • Complements to 100 • Complements to 60 (time) • Complements of tenths that make 1 • Complements of fractions with the same denominator that make 1 e.g. 3/7 + 4/7 = 1 • x 3, x 4, x 8 facts including division facts • Number of seconds in a minute • Number of days in a month and in a year including a leap year	**Year Four Recall** • Review addition and subtraction facts within 20, ensure application to 10, 100 and 1000 (6 + 3, 60 + 30, 600 + 300, 6000 + 3000) • Doubles and halves of multiples of 10, 100 or 1000 (6 + 6, 60 + 60, 600 + 600, 6000 + 6000) • All multiplication and division facts to 12 x 12 • Multiplication and division by zero and one facts • Division and multiplication by 10 and 100 • Conversion of kilometres to metres, hours to minutes, years to months, weeks to days • Complements of hundredths that make 1

Year 3/4 Reception Maths Long Term Plan 2022-2023

Year 3

Curriculum Links

Skill	Linked to Y3 Learning Objectives
Doubling (near doubles) and halving Multiplication/ Investigating Relationships	• Identify, represent and estimate numbers using different representations. • Add and subtract numbers mentally: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds • Add and subtract numbers with up to three digits, using formal written methods of columnar addition. • Solve problems including missing number problems, using number facts, place value, and more complex addition and subtraction • Count from 0 in multiples of 4, 8; count in multiples of 50 and 100 • Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables • Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods. • Estimate the answer to a calculation and use inverse operations to check answers. • Solve problems, including missing number problems, involving multiplication and division • Solve problems including positive integer scaling problems and correspondence problems in which n objects are connected to m objects. • Recognise and show, using diagrams, equivalent fractions with small denominators. • Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators. • Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators • Solve problems that involve all of the fraction skills taught • Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10.
Subtraction from Multiple of 10 and 100 Bridging	• Add and subtract numbers mentally: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds. • Add numbers with up to three digits, using formal written methods of columnar addition. • Subtract numbers with up to three digits, using formal written methods of columnar subtraction.

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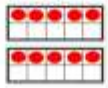
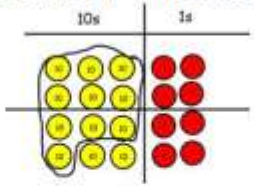
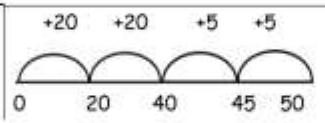
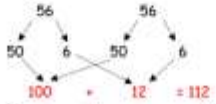
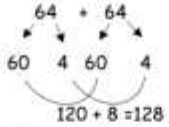
Year 3 Guidance

Underlying skills: Doubling/Near Doubling

Notes	Concrete	Visual to Support Abstract
Revise doubles up to 12 + 12 using strategies from Year 2 if necessary (p26). Also include near doubles. Double multiples of 10, using what is known about single digits. Double multiples that end in 5, (25, 45 etc) Build in opportunities to double/near double when working with place value, addition, subtraction money and measures. Also, include when using formal written methods, so children continue to use mental skills. When doubling, link to x2, so children develop mental methods for x2.	If 20+20 = 40, then what is 25 + 25? Use Dienes or place value counters to prove it.   What does this show? What if each of the counters was worth 10/was replaced with a tens counter? What would 60+60 be? How do you know?  These represent half my sweets. How many sweets do I have in total? Predict, then prove it. Double 64 = 100+20+8.  What number facts could help me find double 64? (Link double 6 to double 60 using practical equipment to begin with).	 What is double 56? How did you work it out? Did anyone find it a different way?  Place value counters may be drawn alongside to illustrate for a short period, if relationships are not fully understood. If double 56=112, what would 56+57 be?  So, what would 64x2=? Revise doubling throughout all tables by exploring and making decisions about different ways to solve calculations, e.g. 4x9 = 9+9+9+9
Reason (to address misconceptions or to make predictions/ generalisations).	• True or false: double 87>140. How do you know? • Double 12<____. What could it be? What couldn't it be? • Sally says 46 +46 = 82 but Rory says he knows this can't be correct. How does he know? • Asif has twenty six 2p coins. He thinks he can find out how much he has by doubling. Is he right?	

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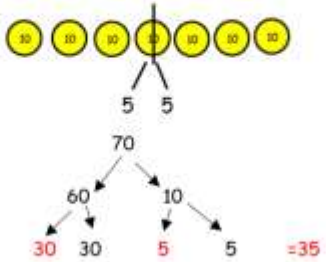
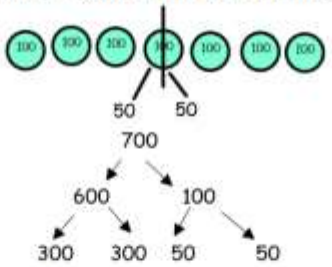
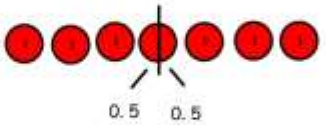
Underlying skills: Halving

Notes	Concrete	Visual to Support Abstract
Use equipment such as Dienes or place value counters to link 2-digit numbers to known facts. If children are not secure from Year 2, build in opportunities to halve 2-digit numbers by halving the tens and halving the ones. Ensure two-digit numbers with an odd number of tens are included. Doubles and halves relationships can be revised when exploring equivalent fractions.	Use a range of concrete apparatus to solve problems and halve - intially by sharing. What is the whole amount? How many parts? What is important about the parts? Write word problems that different representations/ calculations could represent.  Share place value counters in an array (see pages11-14) to show the link between dividing by 2 and halving. E.g. Half of 70. Use Dienes to show exchange in the final 10.  Also use place value counters and predict what will happen to the last ten. Halve 2 digit numbers where the number of tens is odd, e.g. 36, 54, 78 (e.g. Halve the 30, halve the 6 etc). Use a counting stick, Cuisenaire rods etc to find out how many halves are in 2? 3? 4? etc. What do you notice? Why does this happen?  Use decimal place value counters when exploring tenths. Find half of one. How can we write it as a decimal? Halve odd numbers, showing 0.5, e.g. half of 3 = 1.5 or 1 ½.	E.g. Half of 70. Draw Dienes or place value counters.  What would half of 700 be?  Half of 7?  Write down all the fractions equivalent to half. What do you notice?
Reason to address misconceptions or help make generalisations.	• David has 96 cubes. He says if he gives half away, he will have 43 left. Is he right? 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 7.5. Which tower? Explain how you know.	

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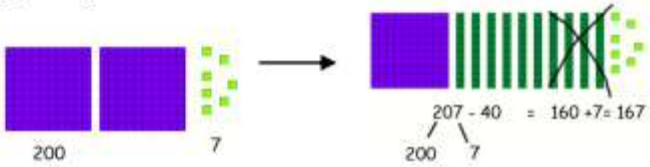
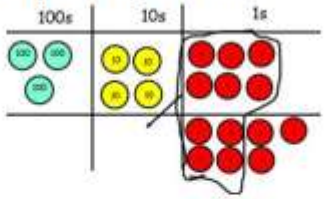
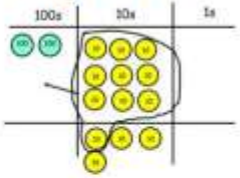
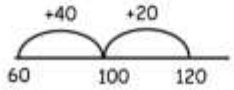
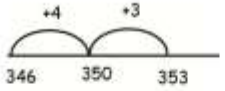
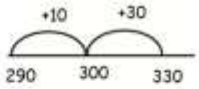
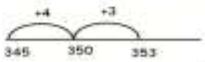
Underlying Skills: Subtraction from Multiples of 10 and 100 and Bridging.

Notes	Concrete	Visual to Support Abstract
Subtraction from multiples of ten is required to be automatic for x9 by subtracting to find the ninth multiple and for recognising relationships when estimating, multiplying and dividing with larger numbers. (E.g. knowing that there will be 24x4= 96 because 25 x4=100). Bridging is required for x3 by tripling.	Discuss strategies during formal written methods, so children learn to decide when to work mentally and when to use a written method. Use Dienes or place value counters to make the link to known facts. 3-digit -1 digit – E.g. 240-7 or 300-4.  E.g. 3 digits –tens – 207-40.  Bridging 3-digit +1 digit - 346+7  3 digit + tens – 290+40. 	Draw the Dienes or place value counters to make link to known facts. E.g.240-7=233 because 10-7=3.  Also, show on number lines. Bridging Links can be made to single digit facts when working with: multiples of ten.  3-digit +1 digit - 346+7  3 digit + tens – 290+40.  Doubles can also be consolidated during this work.
Reasoning - address misconceptions or make generalisations.	Link to known facts, I know 40-7=3 so 240-7=? What would 340-7 be? 300-4=296, 400-4=396, 500-4=496. What do you notice? What would the next calculation be? Spot the mistake: 	

- Revise 3x table from Year 2 before teaching 4x table. Also, revise x9, x11, x12 strategies for all tables so far using a counting stick.
- Notes on inverse operations can be found on pages 11-14.

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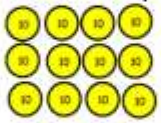
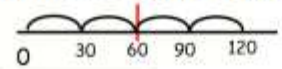
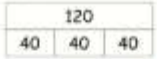
Investigating the Distributive and Associative Law/Working with Larger Numbers (These activities can take place with each table once the concept is secure, to deepen understanding of the properties and application of multiplication).

Notes	Concrete	Visual to Support Abstract
Begin to investigate the distributive (4x5+4x5=8x5) and associative (2x4x5) properties of multiplication informally during practical work.	In pairs, make an array of 4x10. Think about the different ways it can be put into equal groups and how to record.  E.g. Some may find 2x20, 4x10, 8x5. Can they split these further into 2x20 which is the same as 2 lots of 2 tens; or 4x10 which is the same as 4 lots of 2 fives etc. This could be explained as 2x10+2x10 or 4x2x5. Children may record in words (e.g. 2 lots of 2 tens or 2 tens + 2 tens) or just discuss this to explore the concept.	Draw the arrays and circle the different groups you have found. Write calculations. Draw arrays and number lines to represent calculations based around the distributive law, e.g. 3x3+2x4. Can they make up a problem it could represent? When confident, begin to think about how to visually represent the associative law e.g. 2x5x2 (or 2 lots of 5x2).
Use previous strategies and visuals to help understand multiplication and division with larger numbers and fractions. When working with hundreds, also refer to them as the number of tens. E.g. 300 or 30 tens (300).	Explore the effect of multiplying by 10 on part whole/bar models. The bar model shows 10x10=100. Use equipment to find 20x10. Predict 30x10, 40x10 etc.  What do you notice? What about 11x10, 23x10 etc. Use tens counters (or imagine the ones counters are tens) to make the link between known facts and new facts. I know 3x4=12, so what else do I know? 30x4,4x30, 40x3, 3x40. Find associated division facts. Represent these new facts using apparatus that links back to previous work and known facts each time.    Explore with cuisenaire rods/number pieces. If each number piece is equivalent to one whole, how many quarters in 1? 2? 3? Mark a counting stick in ones and together mark on quarters. How many quarters will be in 5 whole ones?What do you notice?	Explore place value relationships on number lines and link back to single digits.    Bertie thinks he can show both the bar models above with an array made out of tens place value counters. Is he right? Link to fractions: Make the link between quarters and dividing by four explicit. E.g. Use cubes with bar models to quarter whole numbers by halving and halving again. Give one quarter on a bar model and use it to find the whole amount (double and double again). Also, reinforce this strategy when working with other fractions where four parts are needed e.g. 4/5,4/8 of a quantity. 

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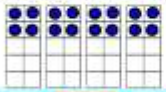
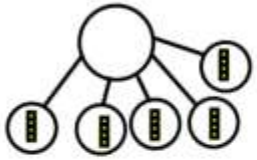
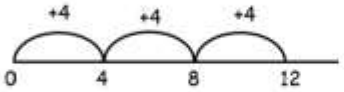
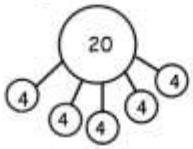
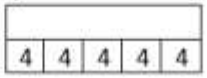
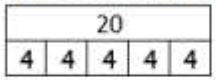
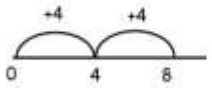
4x Table: Relationships - Skip Counting

Notes	Concrete	Visual to Support Abstract
Revise repeated addition so secure. Show calculations and ask what they could mean, e.g. 3x4 could be 4 lots of 3 or 4 three times, 3 lots of 4 or 3 four times, 3 multiples of 4, 4 multiples of 3, 3+3+3+3 or 4+4+4. Ensure examples which include multiplying by 1 and 0 are included.	Represent and solve problems involving multiplication of four using different types of concrete apparatus. Match representations to calculations and vice versa.  4 + 4 + 4 + 4 = 4x4=  Use counting stick methods (see page 7) to explore the relationships between multiples of 4. Ensure discussion of 11x4 and 12x4 is included and focus upon x9 and x8 particularly, discussing whether this strategy would work for other multiples. E.g. Could you use it for 9x8? (E.g. 80-8). Write down numbers below 40. Which are multiples of 4? Predict which definitely cannot be multiples of 4. Explain why. Prove it. Combine apparatus into part whole models/bar models. Explore which are the parts and which is the whole. How could we say this? (5 lots of 4 or 4 five times).  Match apparatus to multiplication and division calculations and vice versa. Use them to solve missing number calculations practically. E.g. 20÷__=4. Use concrete apparatus to solve ____x____=40. What could it be? What couldn't it be? Revise link between tens and fives (e.g. 4x10 so how many fives?)	Draw empty number lines to solve problems.  Colour the pattern of fours on a 100 square. Discuss. What do you notice? Sort numbers. Which cannot be multiples of 4? How do you know?   Write the multiplication and division statements shown by the completed visuals. Use visuals to find missing numbers and solve problems. E.g. __x4=28. __÷4=9 Write a problem that the visual could represent.  If this shows 5x4, what would 10x4 be?  What tables fact does this show? How can it help you find 4x4? ____x____=40. What could it be? What couldn't it be? Use what is known about multiples of 1, 2,3, 4, 5, 10 to make predictions. Encourage systematic work.

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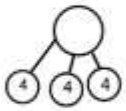
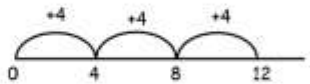
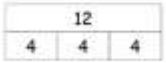
4x Table: Investigating Relationships

Notes	Concrete	Visual to Support Abstract
These strategies rely heavily on the ability to double so this must be secure. See page 21 for introducing arrays. It is important to see the link between x4 and doubling early, as doubling is more efficient than skip counting, especially for later work with larger numbers or decimals. Include problems which involve scaling contexts, e.g. 4 times greater, 4 times as many/much and draw visuals to show these.	 What calculation does the array show? Asif says this shows 3x4=12 but Alex says it shows 4x3=12. Who is right? Explain. Can you use this array to help you work out 6x4? What do you think 12x4 would be? Play a game: show an array and use it to predict new tables facts. Link 2x table to 4x table. Make me an array to show 2x3. What do you think 4x3 would be? Why? Make an array to check.   Make or draw arrays to show different multiplication calculations from 4x table. What facts from 2x table would they show? What do you notice? Winston says any multiple of two will also be a multiple of four. Is he right? How could you find out? Discuss the relationship with division when working and make links to division calculations and problems. (See page Inverse Relationships, pages 11-14). Sort given multiplication calculations according to whether they are correct or incorrect. Explain how you knew, (e.g. Explain why 6x4=23 couldn't be correct). Use this as an opportunity to revise previous tables.	Write calculations to match arrays and draw arrays to match calculations. Look at word problems and find the appropriate multiplication calculation to represent it. Make up a different word problem for the same calculation. Draw arrays/bar models/number lines to show facts from the twos times table. Use them to predict facts from the 4x table.  E.g. 2x4=8, so 4x4=16. On a multiplication grid, record the first 5 facts from the 2 times tables and then repeat for the 4 times table. What do you notice? Represent multiplication and repeated addition statements visually, e.g. show 3 x 4 in four different ways. Write multiplication and division calculations to match and match visuals to calculations. Draw visuals to solve missing problems. E.g. 3x4. _÷4=6.    

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		When showing tables facts, ask for all the different interpretations of what they could mean. E.g. 7x4 could mean 7 multiples of 4, 7 lots of 4, 7 four times, 4 lots of 7, 4 multiples of 7, 4 seven times etc. Discuss different strategies to work it out, drawing on strategies already known to reduce memory load and access a wider range of facts. E.g. 4x7 could be solved by thinking of it as four sevens and using doubling skills. 7+7+7+7 14 14 28
Reason to address misconceptions or help make generalisations.	• True or False: 9x4> 4x3. Explain how you know. • 5x4 < ____ What could go there? What couldn't? Why. • True or false: I can find the product of 5 and 4 by getting 4 lots of 5? • Show 7 lots of 4 on a number line/bar model/part whole model. Now show 4 lots of 7. What's the same? What's different? • Sophie says, "2x2x2 = 6" but Bartosz says she is wrong because "2x2x2=8" who is right. Prove it with concrete apparatus. Prove it with an array.	

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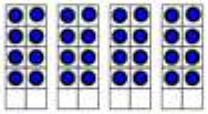
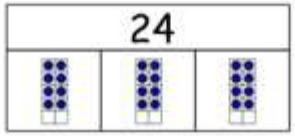
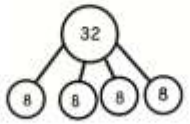
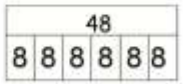
8x Table: Relationships - Skip Counting

Notes	Concrete	Visual to Support Abstract
Revise and make clear the links to prior learning. Children should already know all facts from 0x8 to 5x8 from previous work and be able to quickly find x9, x11, x12. This should be discussed and made explicit. The only new facts are 6x8, 7x8,8x8. Ensure examples which include multiplying by 1 and 0 are included.	Use different types of concrete equipment to solve problems and represent repeated addition, multiplication and division calculations. Write calculations to match concrete representations.  8+8+8+8 4x8  Use cubes/counters to make arrays in eights. Write the multiplication and division statements to go with them. Read out problems and in pairs make the multiplication array to represent it.  Combine concrete equipment into part whole models and bar models. Explore which are the parts and which is the whole. Match calculations to these. Give missing number calculations and solve practically. E.g. __x8=24. Place fours (number pieces/arrangements of spots etc) on a counting stick or number line. Look at the fours and use to predict x8. Find 3x4, what will 3x8=?  Use counting stick methods (see page 7) to explore relationships between multiples of 8 and find more efficient ways to derive them using underlying skills and known facts. Ensure 11x8 and 12x8 is included. If they know 10x8, what would 20x8=? Make sure the relationship between x9 and x8 and the tenth multiple is focused upon particularly and discuss whether this strategy would work for other multiples. E.g. Could you use it for 9x8? (E.g. 80-8) 8x9? (90-16).	Solve problems and represent multiplication and division calculations by drawing arrays, number lines, part whole and bar models. Write calculations or problems to match visuals.   Use number relationships to fill in missing multiples in a number line. Explain how you found them.  Use number lines and counting sticks to explore how many different ways you can find tables facts. E.g. 8x8 could be (10x8)-16, double 4x8 etc. Use bar models/part whole models/number lines to find missing numbers in multiplication and division. E.g. __x8=32 48÷__=8. Always, sometimes, never? A multiple of 4, is also a multiple of 8. A multiple of 8 is a multiple of 4.

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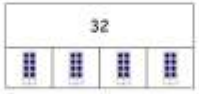
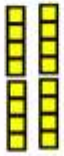
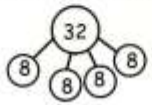
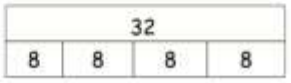
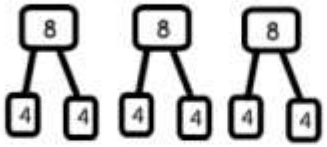
8x Table: Investigating Relationships

These strategies rely heavily on the ability to double so this must be secure. See page 21 for introducing arrays. It is important to show a range of strategies for x8 so children begin to see the connections that exist within multiplication and have a number of strategies at their fingertips to access and apply facts quickly. Discuss the idea of making an amount 8 times greater. What would this look like on a number line? A bar model etc?	Match repeated addition and multiplication calculations to concrete and visual arrays.    Link 4x table to 8x. Make me an array to show 4x8. What do you think 8x8 would be? Why? Make an array to check. How can this bar model help you to find 8x8? Look at equipment such as Cuisenaire rods, cubes etc. How many eights? How many fours? Write multiplication facts to match. What would the division fact be? True or false: 3x8= 6x4? Show me how. How many fours do you think would be in 9 eights? Play a game. Show eights practically and ask children to predict on whiteboards the equivalent number of fours. How many ways can you find 8x9 (Examples may be: Count in 8s, find 4x9 and double it, find 10x8 and take 8 off, find 10x9 and take double 8 off). Examples could be given for children to prove with practical equipment. Make an array to show 8 x 8. True or false: it also shows 2 lots of 4x8? What about 4 lots of lots of 2x2? What about 4x8+4x8? Can you explore to find other ways to break the array down into smaller equal groups? If there are 4 lots of 8, how many lots of 16 will there be?	Look at this array. What multiplication and division facts from the 4x table does it show? Can you use it to draw the fact for the 8x table?  Colour in multiples of 4 and 8 in two different colours on a hundred square. What do you notice? Fill in 4x table on multiplication grid. How could this help you find x8 facts?   How could these help you find 8x8? 3x8=__x4? Prove it (bar model etc).  Which of these facts could this visual show: 6x4; 3x8; (2x4)+(4x4); 3x2x4? Show visuals and explore the different calculations one visual could represent. Draw something to show your strategy to find 8x9. Now draw a different way.

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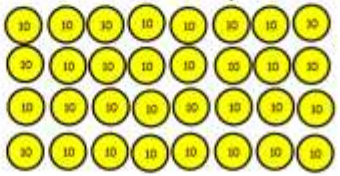
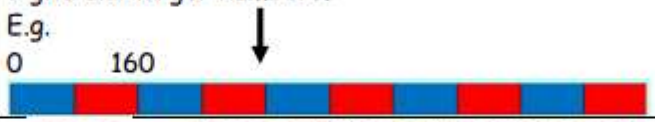
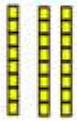
Using visuals to break numbers down can help explore the distributive and associative properties of multiplication in an informal way. Understanding of place value can be developed by using concrete apparatus to link the strategies used with single digit numbers to larger numbers.	 Concrete materials and visuals can be used to develop understanding of multiplication with larger numbers, by making the links to single digit numbers explicit. Make an array with ones. Now make the same array with tens (or imagine the ones are tens).  8x40=320 40x8=320 320÷8=40 320÷40=8 OR 80x4=320 320 ÷4=80 4x80=320 320÷80=4 A counting stick can also be used to make links between single digits and larger numbers. E.g. 0 160 	Draw the arrays made and circle the different groups found. Begin to explore how it might be represented in different ways. Could we show it on a bar model? If children are not secure with place value, drawing arrays where each circle/cross represents a ten instead of a one, can help consolidate their understanding. When showing the division link with larger numbers and practical equipment, sometimes it is appropriate to show it as sharing (e.g. 320÷4=80) and sometimes as grouping (320÷80=4).
Use knowledge of doubles and halves to link quarters and eighths.	 Use a counting stick or number equipment showing eights. How many eighths are in 1 whole? 2? 3? etc. What do you notice? Find Cuisenaire rods to represent eighths and quarters. Investigate equivalence relationships between quarters and eighths and write calculations. E.g. 2 quarters = __ eighths.	<u>Link to fractions:</u> Draw bar models and other pictures divided into eighths to find out many eighths are in whole numbers. Link quarters and eighths. How many quarters would 6 eighths make? 4 eighths make? etc. What do you notice? Show it on bar model/fraction wall.

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Reasoning to address misconceptions or help make generalisations.	• Which is the odd one out: 4+4+4+4+4+4+4+4 8+8+8+8 3+3+3+3 Why? • What's the same? What's different? 8+8+8 3+3+3+3+3+3+3+3 • True or false: 5x4<4x8. Explain. 2x4=8. 3x4=12. 4x4=16. What do you notice? What will 4x8=? 2x8=16. 3x8=24. 40 5 5 5 5 5 5 5 5 Louise says this represents 5 lots of 8. I she right? What multiplication facts does it show? What division facts? Can you write a problem that the bar model might represent?

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Year 4 Guidance

Curriculum Links

Underlying Skill	Linked to Y4 Learning Objectives
Doubling (near doubles), halving, bridging.	• Identify, represent and estimate numbers using different representations. • Add and subtract numbers with up to 4 digits using the formal written methods where appropriate. • Estimate and use inverse operations to check answers to a calculation. • Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why. • Solve number and practical problems that involve increasingly large positive numbers.
Multiplication/ Investigating Relationships.	• Identify, represent and estimate numbers using different representations. • Count in multiples of 6, 7, 9, 25 and 100. • Recall and use multiplication and division facts for the 6,7,9, 11 and 12 multiplication tables • Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers. • Recognise and use factor pairs and commutativity in mental calculations. • Multiply two-digit and three-digit numbers by a one-digit number using formal written layout. • Solve problems involving multiplying and adding including using the distributive law to multiply two-digit numbers by one digit • Solve problems involving multiplying and adding integer scaling problems and harder correspondence problems such as n objects are connected to m objects • Estimate and use inverse operations to check answers to a calculation. • Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as units, tenths and hundredths. • Estimate, compare and calculate different measures, including money in pounds and pence. • Convert between different units of measure (e.g. km to m; hour to minute). • Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days. • Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres. • Find the area of rectilinear shapes by counting squares. • Relationships also used throughout fraction work.

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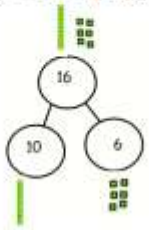
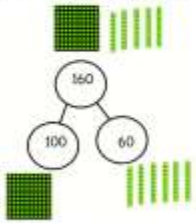
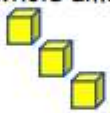
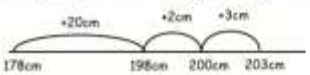
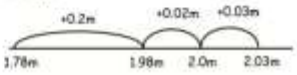
Underlying Skills: Doubles and Halves, Bridging, Subtraction from a Multiple of 10,100,1000.

Notes	Concrete	Visual to Support Abstract
Build in opportunities to double, halve and bridge single digit numbers in formal written methods. Revise these skills with partitioning and place value in mental calculations with larger whole numbers and decimals in the context of money, measures and time. Revise and consolidate the importance of doubling and halving within the tables (i.e. between 5 and 10, 2 and 4, 4 and 8, 3 and 6) during work on fractions. E.g. Draw bar models/fraction walls linking fifths and tenths, thirds and sixths etc. Investigate whether finding one tenth can help to find one fifth or one third can help you to find a sixth. How could this help with division facts?	Use place value counters, Dienes, Numicon etc to represent and solve problems. Include doubling, halving, bridging during work with money using coins practically. (See Y2, page 30, if practical work needed on bridging).  E.g. doubling. 2x16=2x10, 2x6 so double 160=double 100, double 60.  <u>Fractions link:</u> Use Cuisenaire rods/cubes to revise doubling and halving with equivalent fractions. Make all the fractions you can that show one half. On a counting stick or number line marked in ones, show 5. How many halves will there be? What do you notice? Use cuisenaire rods (or cubes) to represent tenths in a whole amount. How many fifths will there be?  E.g. This is 3/10. Make the whole and put it in a bar model. How could you find out how many fifths is it equivalent to? Decimals link:  Share out between 2 people. They get 5/10 each which is the same as half. How will you write half as decimal? So how would one fifth be represented as a decimal? Show it on a bar model.	Draw place value counters or Dienes to help solve initially, moving towards a mental method. Double 16 16 10 6 20 + 12 = 32 Double 160 160 100 60 200 + 120 = 320 E.g. Kemi's room is only 1.78 m wide, but Kyra's is 25cm longer. How long is Kyra's room?   203cm=2.03m. <u>Fractions links</u>: Write down all the fractions equivalent to one half. What do you notice? How many halves are in 2? 3? 4? etc. What do you notice? Why does this happen? Also, use doubles and halves links to explore other equivalent fractions. How many tenths are in one fifth? two fifths etc? How many sixths are in two thirds etc? Draw bar models/fraction walls to prove it.

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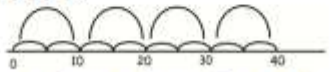
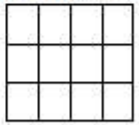
- Guidance on inverse operations can be found on pages 11-14.
- The Distributive Property is included as part of work on each table in Year Four.

Multiplication: The Associative Property

Notes	Concrete	Visual to Support Abstract
Investigate and talk about the associative property (i.e. 8x6=2x4x6 etc) practically. Use all known tables, beginning with those the children are likely to know well and moving on to new tables.	Make an array to show 10x4. True or false: it also shows 2 lots of 2x20 or 2 lots of 4x5?  Explore ways of breaking down arrays into smaller groups, beginning with familiar tables facts, then building onto new tables taught. Use multi-link to make cuboids to explore the associative property. E.g. make a cuboid to show 6x2x3. Build one face, then predict how many cubes you will need. Make it to find out. Can you make any other cuboids with the same number of cubes? Write the calculation that they show. Ravi is going to build a cuboid with sides measuring 4x5x3, whilst Ralph will build one with sides of 5x5x3. Who will need the most cubes to build it? How do you know? Use cubes to show how 2x30=20x3. (2x10x3). Extension: My cuboid is made of 40 cubes. How long could the sides be? Use cubes to find out. Could your multiplication and division facts help you work it out? Could one of the sides be 3 cubes long? How do you know? Show different cuboids (give dimensions) and ask the children to quickly work out on whiteboards its volume (by multiplying in the most efficient way). Discuss the different ways it was calculated.	Teacher could discuss ideas about what this might look like on a number line and bar model and model ideas about grouping. E.g. 40 is broken down into 4 lots of 2x5 (4x2x5).  Or 2 lots of 4x5 (2x4x5).  Draw circles round arrays to match the number lines. Match visuals to calculations and vice versa. In pairs, read out calculations from cards for partner to draw (e.g. 2 lots of 3x4 or 2x3x4). Match the calculations to the visuals drawn together and explain how you made your choice. Build cubes to represent different calculations. E.g. Build a cuboid to show this: 3x2x4. This is one face of my cuboid. Its total volume is less than 60 cubes.  What length could its other side be? What could it definitely not be?

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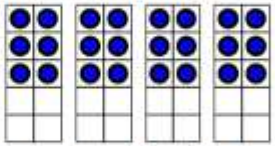
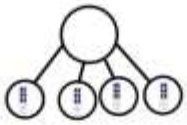
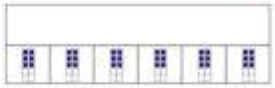
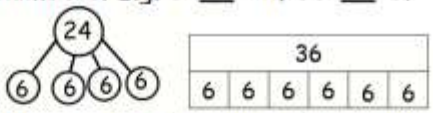
6x Table: Relationships - Skip Counting

Notes	Concrete	Visual to Support Abstract
Ensure doubling, halving and bridging strategies are secure. Make explicit that most of x6 facts are already known from previous tables and revise these using the range of strategies already known. Only 6x6 and 6x7 are not known from another table or strategy. Ensure examples which include multiplying by 1 and 0 are included.	Represent and solve problems using concrete apparatus initially to show relationships.  6 + 6 + 6 + 6 = 4x6=24 24÷6=4 Use counting stick methods (see page 7) to explore relationships between multiples of 6 and find efficient ways to derive them using underlying skills and known facts. Ensure the link to 9x, 11x and 12x is made through use of the tenth multiple.  Make part whole models or bar models to represent calculations and problems. How many parts are needed? How many should there be in each part? What is the whole? Also, include missing numbers in different combinations.  Use to explore relationships. E.g. If this shows 6x6, what do you think 12x6 will be? Fractions link:  Use Cuisenaire rods or other practical equipment. If each piece represents one whole, how many sixths are in 1? 2? 3? etc. What do you notice? Why does this happen? Write down all the fractions equivalent to one sixth. What do notice? Mark a counting stick/number line in ones. How many sixths in 1? 2? 3? etc. Do you spot a pattern?	Colour the multiples of 6 on 100 square. Circle multiples of 3. What do you notice? Give out 2 digit numbers below 60. Which are definitely multiples of 6? Which can't be multiples of 6. How do you know? (E.g. odd numbers). Are there any facts that could help you quickly find out/check (e.g. link to multiples of other tables, such as threes or twelves). Represent multiplication and division calculations visually in different ways and use them to solve problems and find missing numbers. E.g. 6x__=24; 36÷__=6.  Write multiplication and division calculations represented by each visual. Explore multiples rules through problems such as: 60 ÷ __=__ Encourage children to work systematically. What definitely could go there? What definitely couldn't?
Reason to address misconceptions/generalise.	True or False: 9x>6 6x4. Explain how you know. 5x6 < ____ What could go there? What couldn't? Why. Sometimes, always never? Multiples of 3 are also multiples of 6. Show 100 square with some multiples of 5 and 6 circled. Spot which shouldn't be circled/are not multiples of 6.	

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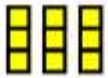
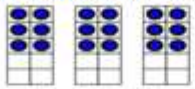
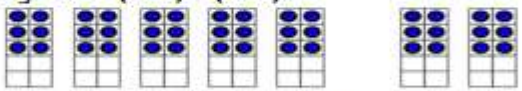
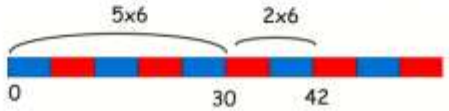
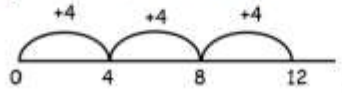
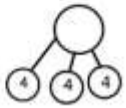
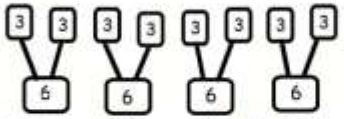
6x Table: Investigating Relationships

Notes	Concrete	Visual to Support Abstract
Make links between x6 and x3 and also between x6 and x5. See page 21 for introducing arrays. Include problems which involve making an amount 6x times greater and discuss how to represent. Explore distributive property of multiplication.	 Make an array to show 3x4. Write/match multiplication and division calculations to different arrays made. Does the array show 3x4=12 or 4x3=12? Explain. Investigate the relationships between 3 times table and 6 times tables. Show a number tripled on a counting stick and use it to predict the 6x fact.  Make me an array to show 3x4. What do you think 6x4 would be? Why? Prove it.  Use a range of equipment showing sixes (e.g. dice, Cuisenaire rods etc) to show 3x3. What would 3x6 be? Try with different amounts of threes. What do you notice? Now show sixes. So how many threes?  Use sixes to write facts from 6x table. Work out what the 3x facts would be. What do you notice? Use practical equipment, arrays and the counting stick to investigate the distributive property. E.g. 7x6= (5x6) + (2x6).  What else could this show? E.g. (2x6)+(3x6)+(2x6). 	Draw arrays (circles/crosses or rectangles drawn on squared paper) to show the facts from 6x table. Write 2 multiplication and 2 division calculations to match each array. (See page Inverse Relationships, page 12-15). Look at pictures of different visuals showing 3x table. Use them to find the related fact from 6x table. E.g.3x4=12, so 6x4=24.    xxxx xxxx xxxx Use visuals to find missing number facts (multiplication and division). True or false: 8x3=4x6. Explain why. Draw something to prove it.  Explore different calculations that visuals can show. E.g. Above could show: (3x3)+ (3x3) + (2x3) or (2x3) +(6x3) or (2x6)+(2x6). Draw visuals to show calculations shown in different ways, e.g. 5x6+3x6. Write an equivalent calculation.

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<table>
<tr>
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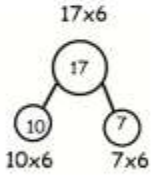
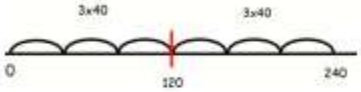
If this is 4x3 what would 4x6 be?
What does this array show? What if each counter was swapped for a tens counter? What could the array show now?
If 3x40 =120, what does 6x40 =?
Write all the multiplication and division facts if the counters are worth one. Repeat, imagining the counters are tens. What if each counter repesented 100? 10p?

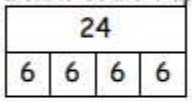
The distributive property should be explored an described when working practically and used in the context of real life problems.

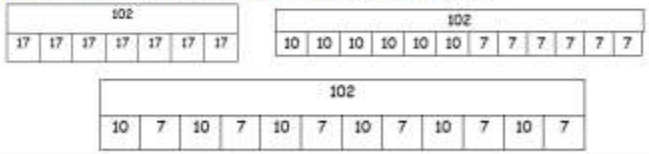
The distributive property can be used when working with 2 digit numbers and can support the understanding of formal written methods. Concrete apparatus can be used in part-whole models and bar models, moving onto representing visually.


True or false: 17x6=10x6+10x7?
</td>
<td>
Draw an array on squared paper to show 4x6.

Imagine each square is worth 10, what facts could the array show now?

Visuals can be used to demonstrate and explain the distributive property and make links between known facts and larger numbers.


Explore the different calculations that the bar model below could represent. E.g. 2x6+2x6 or 1x6+3x6 etc.


Draw bar models, part whole models, number lines and arrays to show a range of calculations and problems. E.g. Jen had 3 boxes of 6 sweets and her friend gave her another 2 boxes of 6 sweets. How many sweets did she have altogether? 3x6+2x6.
Which bar models could represent 17x6:


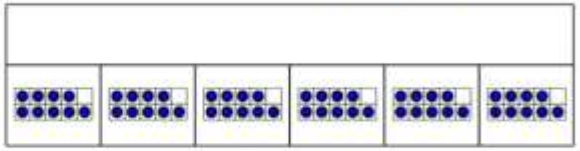
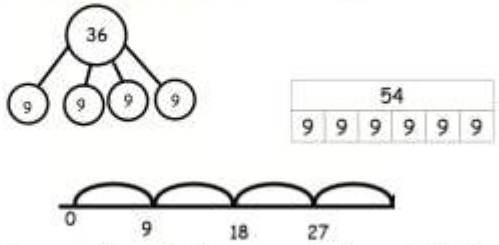
</td>
</tr>
<tr>
<td>Reason to address misconceptions or help make generalisations.</td>
<td colspan="2">

True or false: I can find the product of 5 and 4 by getting 4 lots of 5?
Show 6 lots of 4 on a number line/bar model/part whole model. Now show 4 lots of 6. What's the same? What's different?
Sophie says, "2x3x4 must be greater than 4x3x2. Is she right? Explain how you know. Draw something to prove it.

</td>
</tr>
</table>

Year 3/4 Reception Maths Long Term Plan 2022-2023

9x,11x,12x Table: Relationships - Skip Counting

Notes	Concrete	Visual to Support Abstract
Make explicit that most of x9, x11 and x12 facts are already known or can be quickly worked out using the tenth multiple. Practise using the 10th multiple before exploring skip counting. Ensure examples which include multiplying by 1 and 0 are included.	Use counting stick methods (see page 7) to explore relationships between multiples of 9 and find efficient ways to derive them using underlying skills and known facts. (Repeat when working with 11x and 12x). Use a hundred square and circle any multiple of nine. Get a stick of ten cubes and add them. What do you notice? Predict where the next multiple will be? Is there an easy way to find it? (Add ten and subtract one). How could you show this on a number line? Would this strategy be useful for adding 8? How do you think it could help when adding 11 or 12? Use apparatus showing nines to represent and solve problems and missing number calculations using part whole models and bar models for each table (9x,11x,12x). Explore which are the parts (how many parts, how many in each part) and which is the whole in calculations and problems.  Investigate flexible strategies when adding nine, such as swapping the ones to make an easier calcualtion. E.g. 27+9=20+7+9, so think of it as 29+7 then imagine the one moving over so it becomes 30+6.	Record the multiples of nine when working with a hundred square. What do you notice? What is happening to the tens digit each time. What is happening to the ones digit? Why? Repeat for 11x and 12x. True or false: if a number is a multiple of 9, its digits will always equal 9? Does this work with any multiple of 9? What about multiples of other numbers? Write repeated addition, multiplication and division calculations to match arrays, number lines, part whole models and bar models. Draw visuals to represent and solve calculations and missing number problems. E.g. 36÷ ___=9  True or false: The part whole model shows 2x9+2x9. What else could it show?

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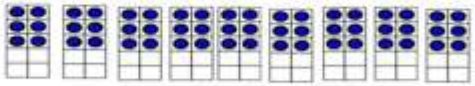
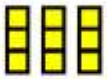
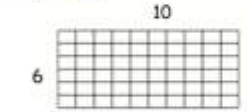
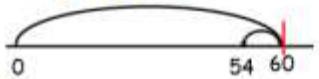
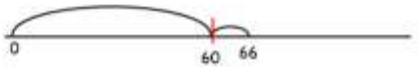
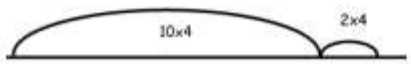
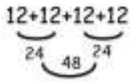
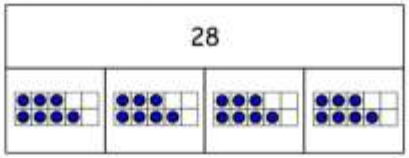
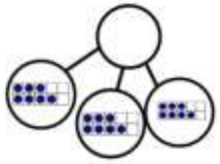
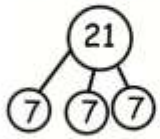
Year 3/4 Reception Maths Long Term Plan 2022-2023

9x, 11x, 12x Table: Investigating Relationships

Notes	Concrete	Visual to Support Abstract
It is important to see the link between x10 and x9 (or 11x, 12x) and make use of the commutative property as this is generally the most efficient method. Also, investigate other relationships to give a range of methods to access different facts.	Revise the facts from 9x that are already known. Point to the tenth multiple on counting stick, number line and use practical apparatus. Ask children to work out 9x for all tables covered so far. (Repeat with 11x,12x). What tables fact are shown below? How can they help us find 9x6?   E.g. If this is 60, what multiple are we counting in? What would 9x6 be? How do you know? How about 11x,12x? How about if the tenth multiple is 50? What would 9x be? etc. (Repeat ideas when working with 11x table and 12x table). If 10x9=90, what would 20x9=? Could this help you find 19x? Investigate the relationship between the threes and nines using equipment such as Cuisenaire rods, Numicon etc  If this is 3x3, what would 6x3 look like? What about 9x3? Explain what you notice? Match repeated addition, multiplication and division calculations to the apparatus. Use apparatus to represent different calculations and to solve problems. Investigate the relationship between the sixes and twelves. Put out apparatus for 6x table. Show arrays or number line visuals from 3x or 6x table. Use them to find facts from 12x table.	Draw number lines and arrays to show 10x fact from different tables and use it to find 9x. (Repeat when working with 11x,12x).  How can we use this to find 9x6?  Moving towards:   Draw rectangles to show arrays from the 9x table. Give out cards with 2-digit numbers on. Which will be multiples of 9? Draw rectangles on squared paper to make arrays and find out. What do you notice about all the multiples of 9? Fill out 3x, 6x and 9x facts on a multiplication grid. What do you notice? Fill out the 6x and 12x times facts. What do you notice? What would happen if we doubled the 12x fact? Look at a calculation. What could it mean? How many ways can you find to solve it? Draw the two ways you find easiest. E.g. 12x4  

Year 3/4 Reception Maths Long Term Plan 2022-2023

7x Table: Relationships - Skip Counting

Notes	Concrete	Visual to Support Abstract
Compare repeated addition and multiplication calculations. Ensure examples which include multiplying by 1 and 0 are included.	Use concrete apparatus in sevens to represent and solve problems. Match repeated addition, multiplication and division calculations to each other and to concrete representations. In what other ways could repeated additions be written? E.g. 7+7+7+7+7 + 7+7 could be written as 5x7 + 2x7. Match calculations to bar models and part whole models. Discuss which are the parts and which is the whole and use this help with solving missing number calculations and problems. E.g. ___x7=28. __÷7=3.    Use counting stick methods (see page 7) to explore relationships between multiples of 7 and to find efficient ways to derive them using underlying skills and known facts. Fractions link:  Use Cuisenaire rods which represent the seven (or other concrete equipment). How many sevenths in 1 piece? 2 pieces, 3 pieces etc. Mark a counting stick/number line in ones. How many sevenths in 1? 2? 3? etc. Do you spot a pattern?	Use representations to explore relationships and solve problems.  The part whole model shows 3x7. Use it to help you find 6x7.  Use the bar model to help you find 8x7. Draw a bar model or number line to show 3x7+2x7. Use a number line to show the relationships from the counting stick and find missing numbers.  Use a bar model or a number line to find the answer: ___x7=63. Write a problem that the calculation could represent. Fractions link: Write down all the fractions equivalent to one seventh. What do notice? Sort fractions that are equivalent to one seventh and those that are not.

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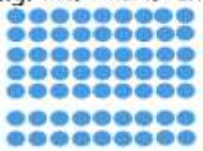
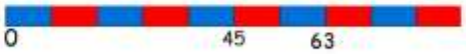
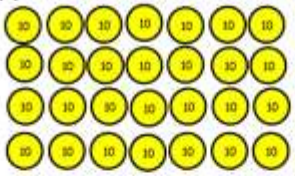
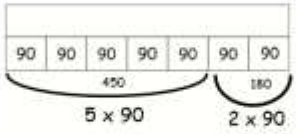
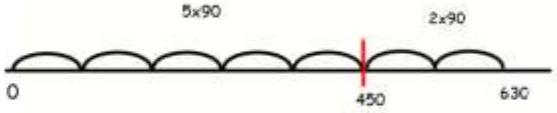
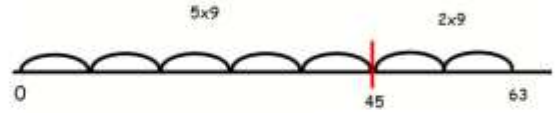
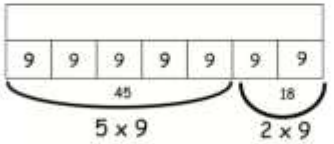
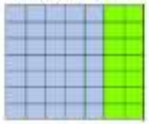
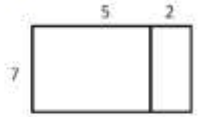
Year 3/4 Reception Maths Long Term Plan 2022-2023

Year 3/4 Reception Maths Long Term Plan 2022-2023

7x Table: Investigating Relationships.

Notes	Concrete	Visual to Support Abstract
Investigate commutative property. Find many different ways to solve same calculations. See page 21 for introducing arrays. Explore distributive property, as this can be helpful for children who can't use other methods to recall the x7 facts, e.g. use of (x5) + (x2) for x7.	Use practical equipment to highlight that most of the x7 facts are already known from other tables. Write multiplication and division calculations to match arrays. Continue to use a range of representations to illustrate the distributive property and show how x5 and x2 facts can be used to find x7. E.g. 7x9 = 5x9 and 2x9.   Concrete and visuals can be used in the same way to help with the application of tables facts with larger numbers.  4x70=280 280÷70=4 70x4=280 280÷4=70. True or false: This array could also show 40x7? 280÷7?   How can 6x7 help you find 60x7? Make/draw an array with tens counters to show me. I know 6x7=42. What else do I know?	Represent visually on number lines, bar models etc.   Draw rectangles to show arrays which represent facts in the 7x table. Show how this can split into the x5 fact and the double.  E.g. 7x7= 5x7 and 2x7= 35+14=49. As children become confident, blank arrays can also be drawn to save time. E.g.  True or false: 6x7>7x5. Explain your thinking. How many ways can you find to solve this tables fact: 7x8. What known facts and strategies could help you? E.g. Find 7x4 twice, find 5x8+2x8, find 10x7 an subtract two sevens. Visually represent the different ways of thinking about the calculation.

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Year 3/4 Reception Maths Long Term Plan 2022-2023