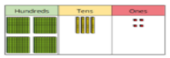
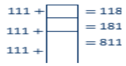
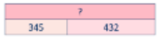
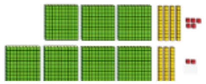
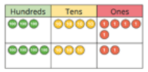
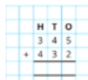
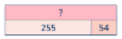
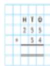
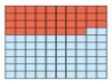
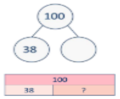
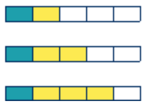
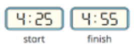
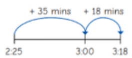
Progression of Addition

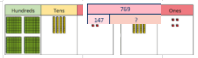
Year 2	Year 3	Year 4
Add 1s to any number (related facts) Add three 1-digit numbers Add across a 10 Add multiples of 10 Add 10s to any number Add two 2-digit numbers (not across a ten) Add two 2-digit numbers (across a ten) Missing numbers	Add 1s, 10s and 100s to a 3- digit number Add two numbers (no exchange) Add two numbers across a 10 or 100 Complements to 100 Add fractions with the same denominator within 1 whole Calculate the duration of events	Add 1s, 10s and 100s to a 4- digit number Add up to two 4-digit numbers Add decimal numbers in the context of money Add fractions and mixed numbers with the same denominator beyond 1 whole

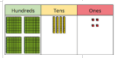
Addition

Year 3	Add numbers mentally, including: 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. Add fractions with the same denominator within 1 whole. Calculate the time taken by particular events or tasks.
Progression of skills	**Key representations**
Add 1s, 10s or 100s to a 3-digit number Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.	The ones/tens/hundreds column will increase by …   444 + 5 = 444 + 50 = 444 + 500 = 777 + 2 = 777 + 20 = 777 + 200 = What patterns do you notice? 235 + 3 = 235 + 30 = 235 + 300 = 604 + 20 = 604 + 50 = 604 + 90 = 
Add two numbers (no exchange) Mental strategies and introduction of formal written method.	… ones + … ones = … ones … tens + … tens = … tens … hundreds + … hundreds = … hundreds     
Add two numbers across a 10 or 100 Formal written method involving up to 2 exchanges including 3-digit plus 2-digit numbers.	There are … ones, so I do/do not need to make an exchange. There are … tens, so I do/do not need to make an exchange. … ones = … ten and … ones. … tens = … hundred and … tens      
Complements to 100 Pairs of numbers which total 100	… plus … is equal to 100   I add … to get to the next 10, then … to get to 100  38 + 62 = 100 62 + 38 = 100 100 = 38 + 62 100 = 62 + 38
Add fractions with the same denominator within 1 whole Make links with known facts.	When adding fractions with the same denominator, I only add the numerator. … fifths + … fifths = … fifths  
Calculate the duration of events Find durations of time between a given start and end point. Children will need to calculate complements to 60	From … to … o'clock is … minutes.  From … o'clock to … is … minutes.  The total time taken is … minutes.  $\frac{1}{5} + \frac{1}{5}$ $\frac{1}{5} + \frac{2}{5}$

Progression of Subtraction

Year 2	Year 3	Year 4
Subtract 1s from any number (related facts) Subtract across a 10 Subtract multiples of 10 Subtract 10s from any number Subtract two 2-digit numbers (not across a ten) Subtract two 2-digit numbers (across a ten) Missing numbers	Subtract 1s, 10s and 100s from a 3-digit number Subtract two numbers (no exchange) Subtract two numbers across a 10 or 100 Complements to 100 Subtract fractions with the same denominator within 1 whole	Subtract 1s, 10s and 100s from a 3-digit number Subtract two numbers (no exchange) Subtract two numbers across a 10 or 100 Complements to 100 Subtract fractions with the same denominator within 1 whole Subtract 1s, 10s, 100s and 1,000s from a 4-digit number Subtract up to two 4-digit numbers Subtract decimal numbers in the context of money Subtract fractions and mixed numbers with the same denominator





Subtraction

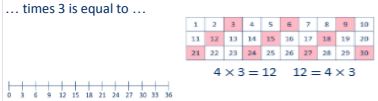
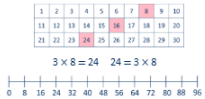
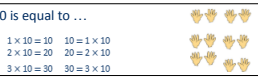
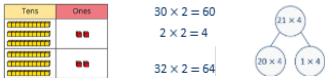
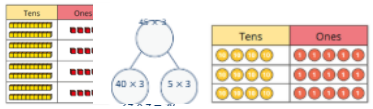
Year 3	Subtract numbers mentally, including: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds. Subtract numbers with up to three digits, using formal written methods. Subtract fractions with the same denominator within 1 whole.
Progression of skills	**Key representations**
Subtract 1s, 10s and 100s from a 3-digit number Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.	The ones/tens/hundreds column will decrease by … 444 – 2 = 444 – 20 = 444 – 200 = 777 – 4 = 777 – 40 = 777 – 400 = What patterns do you notice?
Subtract two numbers (no exchange) Mental strategies and introduction of formal written method.	… tens – … tens = … tens … hundreds – … hundreds = … hundreds 769 147 ?
Subtract two numbers across a 10 or 100 Formal written method involving up to 2 exchanges including 3-digit subtract 2-digit numbers	I need to subtract … ones. I do/do not need to make an exchange. I need to subtract … tens. I do/do not need to make an exchange. I can exchange 1 … for 10 … 72 45 452 43
Complements to 100 **Focus on subtraction facts.** Encourage children to notice patterns.	100 minus … is equal to … 100 38 100 38 ? I subtract … tens, then I subtract … ones. 100 – 38 = 62 100 – 62 = 38 62 = 100 – 38 38 = 100 – 62 – 8 – 30 62 70 100
Subtract fractions with the same denominator within 1 whole Make links with known facts.	… ns with the same denominator, I only subtract the numerator. … fifths – … fifths = … fifths $\frac{5}{5} - \frac{1}{5}$ $\frac{4}{5} - \frac{1}{5}$ $\frac{3}{5} - \frac{1}{5}$ 7/7 2/7

Progression of Multiplication

Year 2	Year 3	Year 4

Link repeated addition and multiplication Use arrays Double The 2 times-table The 10 times-table The 5 times-table Missing numbers	The 3 times-table The 4 times-table The 8 times-table Related facts Multiply a 2-digit number by a 1-digit number - no exchange Multiply a 2-digit number by a 1-digit number - with exchange Scaling Correspondence problems	Times-table facts to 12 × 12 Multiply by 1 and 0 Multiply 3 numbers Factor pairs Multiply by 10 and 100 Related facts Mental strategies Multiply a 2 or 3-digit number by a 1-digit number Scaling Correspondence problems

Multiplication

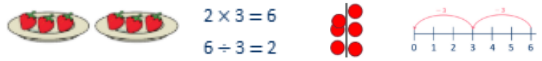
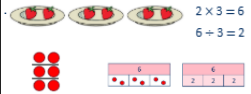
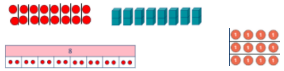
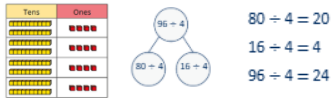
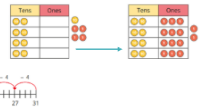
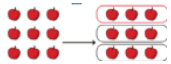
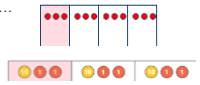
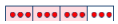
Year 3	>Recall and use multiplication facts for the 3, 4 and 8 multiplication tables. >Write and calculate mathematical statements for multiplication using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods. >Solve problems, including missing number problems, involving multiplication, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects
Progression of skills	**Key representations**
The 3 times-table Encourage daily counting in multiples both forwards and back.	… groups of 3 = … × 3 = 3, … times = 3 × … =  … times 3 is equal to …  4 × 3 = 12 12 = 4 × 3
The 4 times-table Encourage daily counting in multiples both forwards and back. Encourage children to notice links between the 2 and 4 times-tables.	… groups of 4 = … × 4 = 4, … times = 4 × … =  … times 4 is equal to  3 × 4 = 12 12 = 3 × 4
The 8 times-table Encourage daily counting in multiples both forwards and back. Encourage children to notice links between the 2, 4 and 8 times-tables.	… lots of 8 = × 8 = 8, … times = 8 × … =  … times 8 is equal to …  3 × 8 = 24 24 = 3 × 8
Related facts Use knowledge of multiplying by 10 to scale times-table facts.	… × … ones is equal to … ones so … × … tens is equal to … tens.  3 × 4 = 12 3 × 40 = 120
The 10 times-table Encourage daily counting in multiples both forwards and back. Notice the pattern in the numbers.	 … times 10 is equal to …  1 × 10 = 10 10 = 1 × 10 2 × 10 = 20 20 = 2 × 10 3 × 10 = 30 30 = 3 × 10
Multiply a 2-digit number by a 1-digit number - no exchange Children apply their understanding of partitioning to represent and solve calculations using the expanded method.	… tens multiplied by … is equal to … tens. …ones multiplied by … is equal to … ones.  30 × 2 = 60 2 × 2 = 4 32 × 2 = 64 
Multiply a 2-digit number by a 1-digit number - with exchange Children apply their understanding of partitioning to represent and solve calculations using the expanded method	… tens multiplied by … is equal to … tens. … ones multiplied by … is equal to … ones 
Scaling Children focus on multiplication as scaling (…. times the size) as opposed to repeated addition.	There are …. times as many … as …  There are 3 times as many triangles as circles. … is … times the size of … … is … times the length/height of …  Miss Smith is twice the height of Jo.
Correspondence problems (How many ways?)	For every … , there are … possible … There are … × … possibilities altogether  For every hat, there are two possible scarves

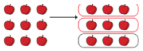
Encourage children to work systematically to find all the different possible combinations.	There are … × … possibilities altogether.  	scarves. 3 × 2 = 6 There are 6 possibilities altogether.

Progression of Division

Year 2	Year 3	Year 4
Divide by 2 Divide by 10 Divide by 5 Missing numbers Unit fractions Non-unit fractions	Divide by 3 Divide by 4 Divide by 8 Related facts Divide a 2-digit number by a 1-digit number - no exchange Divide a 2-digit number by a 1-digit number - with remainders Unit fractions of a set of objects Non-unit fractions of a set of objects	Division facts to 12 × 12 Divide a number by 1 and itself Related facts Divide a 2 or 3-digit number by a 1-digit number Divide by 10 and 100

Division

Year 3	Recall and use division facts for the 3, 4 and 8 multiplication tables. Write and calculate mathematical statements for 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. Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.	
Progression of skills	**Key representations**	
Divide by 3 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	There are … groups of 3 in … … ÷ 3 = 2 × 3 = 6 6 ÷ 3 = 2 	has been shared equally into 3 equal groups. 
Divide by 4 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	There are … groups of 4 in … … ÷ 4 = 2 × 4 = 8 8 ÷ 4 = 2 	… has been shared equally into 4 equal groups. … ÷ 4 = 
Divide by 8 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	There are … groups of 8 in … … ÷ 8 = 2 × 8 = 16 16 ÷ 8 = 2 	… has been shared equally into 8 equal groups. … ÷ 8 = 2 × 8 = 16 16 ÷ 8 = 2 
Related facts Link to known times-table facts.	… ÷ … is equal to …, so … tens ÷ … is equal to … tens. 12 ÷ 3 = 4 120 ÷ 3 = 40 	
Divide a 2-digit number by a 1-digit number - with remainders Encourage children to partition numbers flexibly to help them to divide more efficiently.	… ÷ … is equal to …, so … tens ÷ … is equal to … tens. 12 ÷ 3 = 4 120 ÷ 3 = 40  80 ÷ 4 = 20 16 ÷ 4 = 4 96 ÷ 4 = 24	There are … groups of … There are … remaining. 31 ÷ 4 = 7 r3 
Unit fractions of a set of objects Bar models are useful to show the link between division and fractions, for	The whole is divided into … equal parts. Each part is 1/ _ of the whole. 	One … of … is … 1 of 12 is 3 4 
Non-unit fractions of a set of objects Bar models are a useful	The whole is divided into … equal parts. Each part is 1 of the whole. 	1 of … is …, soof … is … 

	Bar models are a useful representation and show the links with division and multiplication.	3 of 12 apples is 9 apples. 4		3 of 12 is 9 4 2 of 36 is 24 3