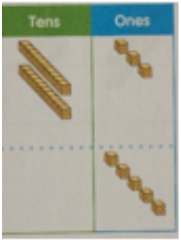
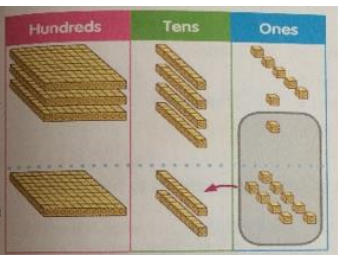




EDWARD WILSON
PRIMARY SCHOOL

Edward Wilson Primary School Calculation Policy 2022

ADDITION

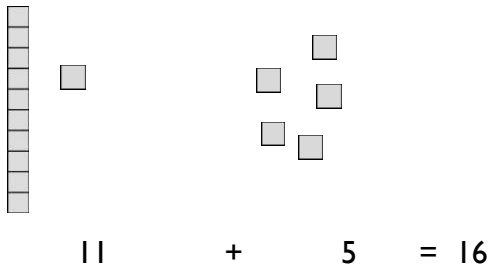
Year 1	Year 2	Year 3
Key Vocabulary: add, more, plus, and, make, altogether, total, equal to, equals, doubles, most, count on, number line, exchanging, regrouping End of Year Objective: Add one-digit and two-digit numbers to 20, including zero (using concrete objects and pictorial representations – diennes (base 10) equipment). Knowledge of number bonds to 10 and 20. Solve one step problems $- 9 = 7$ Can use exchange games and can record their work $6 + 3 = 9$ $10 + 4 = 14$ $10 + 9 = 19$ Use exchange with 1s and 10s	Key Vocab: add, more, plus, and, make, altogether, total, equal to, equals, doubles, most, count on, number line, sum, tens, ones, partition, addition, exchanging regrouping End of Year Objective: Fluency in addition facts to 20. Derive and use related facts up to 100 ($3 + 4 = 7$ $30 + 40 = 70$ $7 - 4 = 3$ $70 - 40 = 30$) Add a two digit and a ones ($27 + 6 = 33$) Add a two digit number add tens ($23 + 30 = 53$) Add two, two digit numbers ($24 + 27 = 51$) Partition a 3 digit number using 100s, 10s, 1s Adding multiples of 10 and 100s to numbers Understand that addition can be done in any order (commutative) Solve problems including using inverse Use decimal notation to record money $£1.20 +$	Key Vocab: add, more, plus, and, make, altogether, total, equal to, equals, doubles, most, count on, number line, sum, tens, ones, partition, addition, exchanging, regrouping End of Year Objective: Read and write numbers in 1000 in numerals and words Add numbers with up to three digits mentally- ($249 + 50$ $381 + 400$ $175 + 8$) Add numbers with up to three digits using formal written methods of column addition. Solve problems including missing number problems, using number facts Use inverse to check calculations
Key Equipment: diennes equipment, multi-link, marbles, number balances Key concept: Using concrete representations to support 'counting on' and part, part whole relating addition to number bonds. <i>- Adding by counting on:</i>  Counting on from the greater number gives you an answer. Adding by using number bonds and part, part whole.	Key Equipment: diennes equipment, multi-link Key concept: Use place value charts with concrete representations to show addition of a 1-digit, 2-digit or 3-digit number with and without regrouping. Addition without regrouping. $23 + 5 =$  25 $+ 3$ 28 First add the ones 3 ones add 5 ones = 8 ones. Then add the tens. Two tens add zero tens = two tens. $23 + 5 = 28$	Key Equipment: diennes equipment, multi-link Key concept: Use place value charts with concrete representations to show addition of a 1-digit, 2-digit or 3-digit number with and without regrouping. Start with regrouping the ones.  First add the ones. 123 $+ 5$ 128 3 ones + 5 ones = 8 ones Then add the tens. 123 $+ 5$ 128 2 tens + 0 tens = 2 tens Finally add the hundreds. 123 $+ 5$ 128 1 hundred + 0 hundreds = 1 hundred

How many penguins are there altogether?

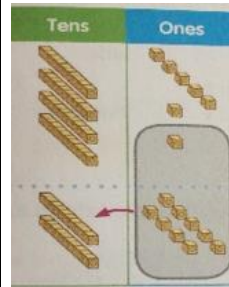
$$3 + 5 = ?$$



Children use diennes equipment to understand tens and ones. They can exchange 10 ones for 1 ten, 2 tens for 20 ones etc. They will use Base 10 equipment to make teens numbers using separate tens and ones. They can then start to add these together.



Adding with regrouping the ones.



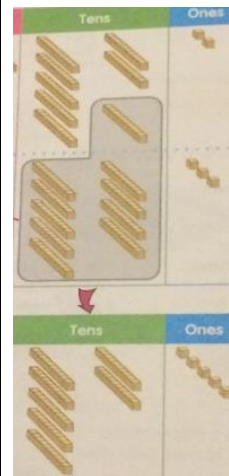
$$\begin{array}{r} 47 \\ + 29 \\ \hline 76 \\ 1 \end{array}$$

First add the ones
7 ones + 9 ones = 1 ten
6 ones.

Regroup the ones.
16 ones – 1 ten 6 ones.
Then add the tens.

Two tens add zero tens
= two tens.

Adding with regrouping the tens.



$$\begin{array}{r} 82 \\ + 93 \\ \hline 175 \\ 1 \end{array}$$

First add the ones
2 ones + 3 ones = 1 ten
5 ones.

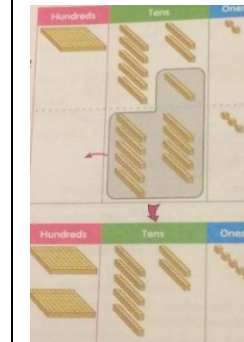
Then add the tens.

8 tens + 9 tens = 17
tens.

Regroup the tens = 1
hundred 7 tens.

Finally add the
hundreds.
1 hundred + zero
hundred = 1 hundred.

Adding with regrouping the tens.



$$\begin{array}{r} 182 \\ + 93 \\ \hline 275 \\ 1 \end{array}$$

First add the ones
2 ones + 3 ones = 1 5
ones.
Then add the tens.
8 tens + 9 tens = 17
tens.
Regroup the tens = 1
hundred 7 tens.
Finally add the
hundreds.
1 hundred + 1 hundred =
2 hundreds.

Adding with regrouping the tens and ones.

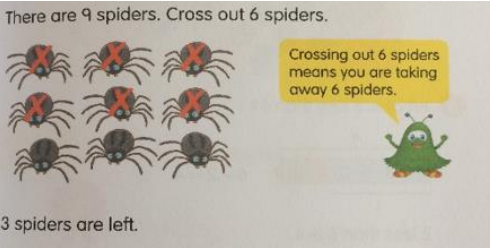
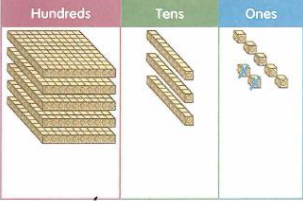
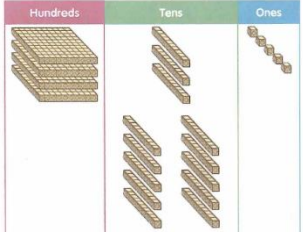
$$278 + 386 =$$

Follow model using diennes equipment.

$$\begin{array}{r} 278 \\ + 386 \\ \hline 664 \\ 11 \end{array}$$

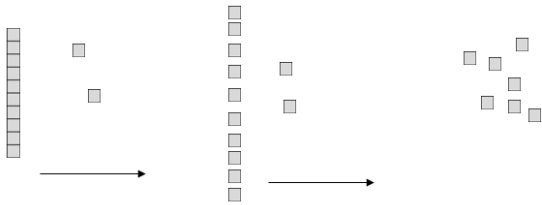
Year 4 Key vocabulary: add, more, plus, and, make, altogether, total, equal to, equals, doubles, most, count on, number line, sum, tens, ones, partition, addition, exchanging, regrouping, thousands, hundreds, digits, inverse End of Year Objective: Add numbers with up to 4 digits and decimals with one decimal place using the formal written method of column addition where appropriate.	Year 5 Key vocabulary: add, more, plus, and, make, altogether, total, equal to, equals, doubles, most, count on, number line, sum, tens, ones, partition, addition, exchanging, regrouping, thousands, hundreds, digits, inverse, decimal places. Decimal point, tenths, hundredths, thousandths End of Year Objective: Add whole numbers with more than 4 digits and decimals with two decimal places, including formal written methods (column addition).	Year 6 Key vocabulary: add, more, plus, and, make, altogether, total, equal to, equals, doubles, most, count on, number line, sum, tens, ones, partition, addition, exchanging, regrouping, thousands, hundreds, digits, inverse, decimal places. Decimal point, tenths, hundredths, thousandths End of Year Objective: Add whole numbers and decimals using formal written methods (column addition).
Key Equipment: diennes equipment, Key concept: Use formal column method to add up to 4 digit numbers including up to one decimal place. $ \begin{array}{r} 3364 \\ + \quad 247 \\ \hline 3611 \\ \hline \end{array} $ $ \begin{array}{r} 272.4 \\ + 347.3 \\ \hline 619.7 \\ \hline 1 \end{array} $	Key concepts. Use formal column method to add numbers with decimals up to two decimal places (with each number having the same number of decimal places), knowing that the decimal points line up under one another. Adding different amounts of money and measures, including those where they have to initially convert from one unit to another $ \begin{array}{r} 3121 \\ \quad 37 \\ + \quad 148 \\ \hline 3306 \\ \hline \end{array} $ $ \begin{array}{r} 3.5 \\ + 2.4 \\ \hline 6.0 \\ \hline \end{array} $	Key concepts. Use formal column method to add numbers with decimals up to two decimal places (with each number having the same number of decimal places), knowing that the decimal points line up under one another. Adding different amounts of money and measures, including those where they have to initially convert from one unit to another $ \begin{array}{r} 42 \\ 6432 \\ 786 \\ \quad 3 \\ + \quad 4681 \\ \hline 111944 \\ \quad 121 \\ \hline 1121 \end{array} $ $ \begin{array}{r} 401.20 \\ 26.85 \\ + \quad 0.71 \\ \hline 428.76 \\ \hline \end{array} $ When adding decimals with different numbers of decimal places, children should be taught and encouraged to make them the same through identification that 2 tenths is the same as 20 hundredths, therefore, 0.2 is the same value as 0.20.

SUBTRACTION

Year 1	Year 2	Year 3
Key Vocabulary: equal to, take away, less, minus, subtract, leaves, how many more, how many fewer/ less than, most least, how many left, how much less is...? End of Year Objective: Subtract one-digit and two-digit numbers to 20, including zero (using concrete objects and pictorial representations).	Key vocabulary: equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer, less than, most, least, count back, how many left? Difference, count on, strategy, partition, tens, ones End of Year Objective: Subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones; a two-digit number and tens; two two-digit numbers.	Key Vocabulary: equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer, less than, most, least, count back, how many left, how much less is...? difference, count on, strategy, partition, tens, ones, exchange, decrease, hundreds, value, digit End of Year Objective: Subtract numbers with up to three digits, using formal written method of column subtraction.
Key Equipment: diennes equipment, multi-link, marbles, straws. Key concept: Use the 'taking away' concept to subtract. Use the 'counting on' strategy to subtract. Use the 'counting back' strategy to subtract. Relate subtraction to number bonds. subtract using number bonds. There are 9 spiders. Cross out 6 spiders.  Introduce subtraction as 'taking away.' Give children concrete apparatus such as multi-link to try out questions such as 8-3 = 5.  Children will begin to record their work in their books.	Key Equipment: diennes equipment Key concept: The 'taking away' concept is related to calculation in subtraction. Use place value charts and concrete representations to show subtraction of a 1-digit or 2- digit number. Subtract a 1-digit or 2-digit number from a 2- digit number with and without regrouping using both horizontal and column subtraction. Subtraction without regrouping. $\begin{array}{r} 84 \\ - 3 \\ \hline 81 \end{array}$ First subtract the ones. 4 ones – 3 ones = 1 one. Then subtract the tens. 8 tens – 0 tens = 8 tens.  84 – 3 = 81	Key equipment: diennes equipment. Key concept: The regrouping concept in subtraction. Use place value charts and concrete representations to show regrouping from tens to ones in subtraction. Subtract a 3-digit number from another 3-digit number with regrouping the tens to ones using both horizontal and column subtractions. Subtraction with regrouping. 537 – 272 = 537 – 272 = ?  First subtract the ones. $\begin{array}{r} 537 \\ - 272 \\ \hline 5 \end{array}$ 7 ones – 2 ones = 5 ones First subtract the ones. 7 ones – 2 ones = 5 ones.  Regroup the hundreds and tens. $\begin{array}{r} 4537 \\ - 272 \\ \hline 5 \end{array}$ 5 hundreds 3 tens = 4 hundreds 13 tens Re-group the hundreds and tens. 5 hundred 3 tens = 4 hundreds 13 tens.

Children use base 10 equipment to record their findings initially using whiteboards to show their working before progressing to recording their work in books.

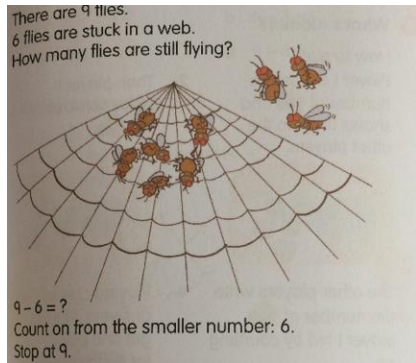
$$12 - 5 = 7$$



CHILDREN EXCHANGE ONE TEN BLOCK FOR TEN ONES.

THEY NOW SUBTRACT THE FIVE TO LEAVE SEVEN ONES

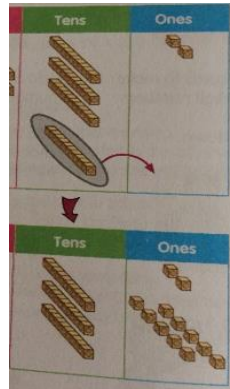
Introduce children to counting on method of subtraction. "Finding the difference" will give you the same answer as subtraction/takeaway.



Subtraction with regrouping.

$$\begin{array}{r} 42 \\ -28 \\ \hline \end{array}$$

We can't subtract 8 ones from two ones so we regroup the ones and tens.



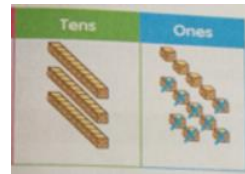
$$\begin{array}{r} 34 \cancel{1} 2 \\ -28 \\ \hline 4 \end{array}$$

Regroup the tens and ones.

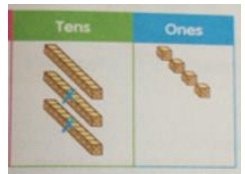
4 tens 2 ones = 3 tens 12 ones.

First subtract the ones.

12 ones – 8 ones = 4 ones.

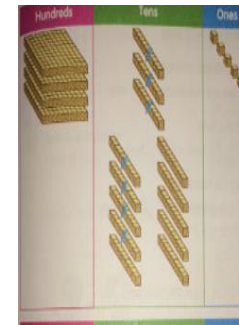


12 ones – 8 ones = 4 ones.



$$\begin{array}{r} 34 \cancel{1} 2 \\ -28 \\ \hline 14 \end{array}$$

3 tens – 2 tens = 1 ten



$$\begin{array}{r} 537 \\ -272 \\ \hline 265 \end{array}$$

$$537 - 272 = 265$$

Subtract the tens.
13 tens – 7 tens = 6 tens.

Subtract the hundreds. 4 hundreds – 2 hundreds = 2 hundreds.

Year 4	Year 5	Year 6
Key Vocabulary: equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer, less than, most, least, count back, how many left, how much less is...? difference, count on, strategy, partition, tens, ones, exchange, decrease, hundreds, value, digit, inverse End of Year Objective: Subtract numbers with up to 4 digits and decimals with one decimal place using the formal written method of column subtraction where appropriate.	Key Vocabulary: equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer, less than, most, least, count back, how many left, how much less is...? difference, count on, strategy, partition, tens, ones, exchange, decrease, hundreds, value, digit, inverse End of Year Objective: Subtract whole numbers with more than 4 digits and decimals with two decimal places, including formal written methods (column subtraction).	Key Vocabulary: equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer, less than, most, least, count back, how many left, how much less is...? difference, count on, strategy, partition, tens, ones, exchange, decrease, hundreds, value, digit, inverse End of Year Objective: Subtract whole numbers and decimals using formal written methods (column subtraction).
Key Equipment: diennes equipment Key concept: Children will use their formal method to subtract up to 4 digit numbers including to one decimal place using formal column method. $ \begin{array}{r} ^8 ^{14} \\ 4 7 5 14 \\ - 3 2 8 6 \\ \hline 1 4 6 8 \end{array} $	Key Equipment: diennes equipment Key concept: Children will use their formal method to subtract more than 4 digit numbers including to two decimal place using formal column method. $ \begin{array}{r} ^2 ^{13} \\ 3 . 4 12 \\ - 1 . 7 6 \\ \hline 1 . 6 6 \end{array} $	Key Equipment: diennes equipment Key concept: Children will use their formal method to subtract more than 4 digit numbers including to two decimal place using formal column method. $ \begin{array}{r} ^3 ^1 ^6 ^{11} ^{10} \\ 4 1 7 2 10 \\ - 3 4 . 7 1 \\ \hline 3 8 2 . 4 9 \end{array} $ When subtracting decimals with different numbers of decimal places, children should be taught and encouraged to make them the same through identification that 2 tenths is the same as 20 hundredths, therefore, 0.2 is the same value as 0.20.

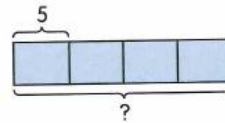
MULTIPLICATION

Year 1 Key vocabulary: groups of, lots of, times, array, altogether, multiply, count End of Year Objective: Solve one-step problems involving multiplication by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.	Year 2 Key Vocabulary: groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, commutative, sets of, equal groups, times as big as, once, twice, three times End of Year Objective: Calculate mathematical statements for multiplication (using repeated addition) and write them using the multiplication (x) and equals (=) signs.	Year 3 Key Vocabulary: groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, row, commutative, sets of, equal groups, times, times as big as, once, twice, three times, partition, grid method, multiple, product, tens, ones, value End of Year Objective: Write and calculate mathematical statements for multiplication using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, progressing to formal written methods.								
Key equipment: toys, trays, egg boxes, Key concept: Relate repeated addition to the multiplication concept; use concrete representations to show the concept of multiplication as repeated addition; How many groups of toys are there? How many toys are there in each group?  2 toys  2 toys  2 toys There are 3 groups. Each group has 2 toys. $2 + 2 + 2 = 6$ 3 twos = 6 3 groups of 2 = 6 There are 6 toys altogether.	Key equipment: toys, trays, egg boxes, Key concept: Multiplying a fixed number of objects by a certain number of times. How many cows are there?  1 First count the number of groups. There are 3 groups. Then count the number of cows in each group. There are 5 cows in each group. $5 + 5 + 5 = 15$ $3 \times 5 = 15$ There are 15 cows altogether. 2 First count the number of items in each group. There are 5 cows in each group. Then count the number of groups. There are 3 groups. The number 5 is multiplied 3 times. $5 \times 3 = 5 + 5 + 5 = 15$ There are 15 cows altogether. Children practice multiplying numbers by 2,3, 4, 5 and 10 using doty paper.	Key equipment: Diennes equipment. Key concepts: Use arrays to model portioning of numbers. Use concrete representations in a place value chart to show multiplication of a 2 digit number. Children use arrays to visualise multiplication. They understand that multiplication is commutative and can be done in any order. Multiplication without regrouping. $12 \times 3 = ?$ <table><tr><th>Tens</th><th>Ones</th></tr><tr><td></td><td>  </td></tr></table> First multiply the ones by 3. $\begin{array}{r} 12 \\ \times 3 \\ \hline 6 \end{array}$ 2 ones $\times 3 = 6$ ones <table><tr><th>Tens</th><th>Ones</th></tr><tr><td></td><td>  </td></tr></table> Then multiply the tens by 3. $\begin{array}{r} 12 \\ \times 3 \\ \hline 36 \end{array}$ 1 ten $\times 3 = 3$ tens $12 \times 3 = 36$ When we multiply 12 by 3, we get the product of 12 and 3. 36 is the product of 12 and 3.	Tens	Ones		  	Tens	Ones		  
Tens	Ones									
	  									
Tens	Ones									
	  									

Help children interpret the model. The rectangles represent the 4 packets and each rectangle represents five bread rolls.

Peter puts 5 bread rolls into each packet.
He has 4 packets.

How many bread rolls does he put into the 4 packets altogether?



$$4 \times 5 = 20$$

Peter puts 20 bread rolls into the 4 packets.

4 groups of
5 bread rolls



1 $68 \times 2 = ?$



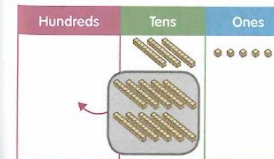
First multiply the **ones** by 2.

$$\begin{array}{r} 68 \\ \times 2 \\ \hline 6 \end{array}$$



8 ones $\times 2 = 16$ ones

Regroup the ones:
16 ones = 1 ten 6 ones

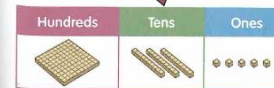


Then multiply the **tens** by 2.

$$\begin{array}{r} 68 \\ \times 2 \\ \hline 136 \end{array}$$

6 tens $\times 2 = 12$ tens

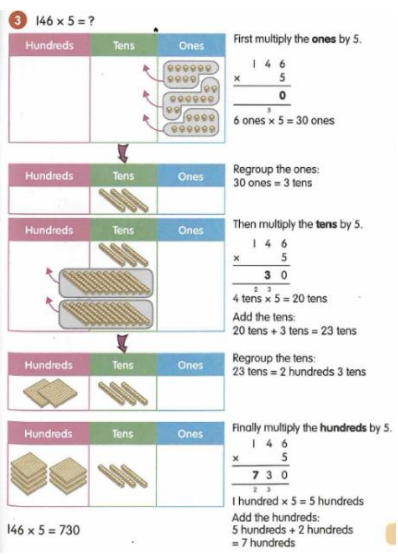
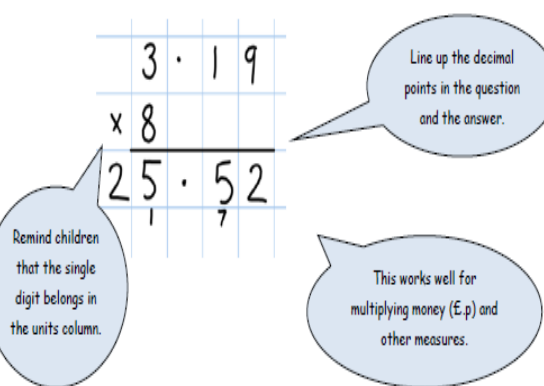
Add the tens:
12 tens + 1 ten = 13 tens



Regroup the tens:
13 tens = 1 hundred 3 tens

$$68 \times 2 = 136$$

MULTIPLICATION

Year 4 End of Year Objective: Multiply two-digit and three-digit numbers by a one-digit number using formal written layout. Know all their times tables and be fluent in number facts e.g. $7 \times 4 = 28$ $7 \times 40 = 280$ Key vocabulary: groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, row, commutative, sets of, equal groups, times, times as big as, once, twice, three times, partition, grid method, total, multiple, product, factors, sets of, inverse	Year 5 End of Year Objective: Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers. Key vocabulary: groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, row, commutative, sets of, equal groups, times, times as big as, once, twice, three times, partition, grid method, multiple, product, tens, ones, value, product, sets of, inverse, square, factor, integer, decimal, short/long multiplication,	Year 6 End of Year Objective: Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication. Multiply one-digit numbers with up to two decimal places by whole numbers. Key vocabulary: groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, row, commutative, sets of, equal groups, times, times as big as, once, twice, three times, partition, grid method, multiple, product, tens, ones, value, product, sets of, inverse, square, factor, integer, decimal, short/long multiplication, tenths, hundredths, decimal
Key equipment: Diennes Key concept: A number up to 1000 can be conceptualised as the sum of its values in the ones, tens and hundreds places. Multiplication of a 2-digit number or a 3-digit number by a 1-digit number is the sum of multiplying values from different places.  $146 \times 5 = 730$	Key equipment: Diennes Key concept: Using a formal algorithm to multiply up to 4 digit by a 1 and 2-digit whole number. Multiplication with regrouping. Step 1 Multiply 6 ones by 3. 6 ones $\times$ 3 = 18 ones = 1 ten 8 ones Step 2 Multiply 7 tens by 3. 7 tens $\times$ 3 = 21 tens = 2 hundreds 1 ten Add 1 ten. 2 hundreds 1 ten + 1 ten = 2 hundreds 2 tens Step 3 Multiply 4 hundreds by 3. 4 hundreds $\times$ 3 = 12 hundreds = 1 thousand 2 hundreds Add 2 hundreds. 1 thousand 2 hundreds + 2 hundreds = 1 thousand 4 hundreds Step 4 Multiply 2 thousands by 3. 2 thousands $\times$ 3 = 6 thousands Add 1 thousand. 6 thousands + 1 thousand = 7 thousands Mark sells 7428 oranges. Th H T O $\begin{array}{r} 2476 \\ \times 3 \\ \hline 8 \\ 21 \\ 7428 \end{array}$ Multiply a 2 digit number by a 2 digit number.	Key equipment: Diennes Key concept: Using a formal algorithm to multiply up to 4 digit by a 2 - digit whole number. Children continue to practice formal column methods and extend to decimal numbers. 

Step 1

Multiply 2 tens 7 ones by 2.

$$7 \text{ ones} \times 2 = 14 \text{ ones}$$

$$= 1 \text{ ten } 4 \text{ ones}$$

$$2 \text{ tens} \times 2 = 4 \text{ tens}$$

Add.

$$4 \text{ tens} + 1 \text{ ten } 4 \text{ ones} = 5 \text{ tens } 4 \text{ ones}$$

$$27 \times 2 = 54$$

$$\begin{array}{r} 1 \\ 27 \\ \times 32 \\ \hline 54 \end{array}$$

Step 2

Multiply 2 tens 7 ones by 30.

$$7 \text{ ones} \times 30 = 210 \text{ ones}$$

$$= 21 \text{ tens}$$

$$= 2 \text{ hundreds } 1 \text{ ten}$$

$$2 \text{ tens} \times 30 = 60 \text{ tens}$$

$$= 6 \text{ hundreds}$$

Add.

$$6 \text{ hundreds} + 2 \text{ hundreds } 1 \text{ ten}$$

$$= 8 \text{ hundreds } 1 \text{ ten}$$

$$27 \times 30 = 810$$

$$\begin{array}{r} 2 \\ 1 \\ 27 \\ \times 32 \\ \hline 54 \\ 810 \end{array}$$

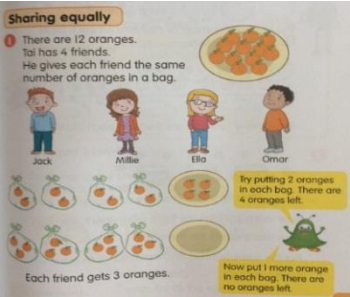
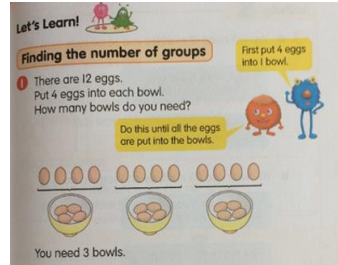
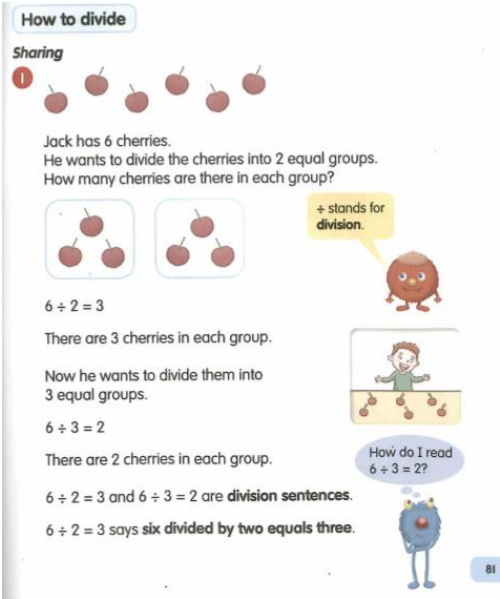
Step 3

Add.

$$54 + 810 = 864$$

$$27 \times 32 = 864$$

$$\begin{array}{r} 2 \\ 1 \\ 27 \\ \times 32 \\ \hline 54 \\ 810 \\ \hline 864 \end{array}$$

Year 1 Key vocabulary: share, share equally, one each, two each..., group, groups of, lots of, End of Year Objective: Solve one-step problems involving division by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.	Year 2 Key vocabulary: share, share equally, one each, two each..., group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, quotient End of Year Objective: Calculate mathematical statements for division within the multiplication tables and write them using the division ($\div$) and equals (=) signs.	Year 3 Key vocabulary: share, share equally, one each, two each..., group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, quotient, inverse, short division, remainder, multiple. End of Year Objective: Write and calculate mathematical statements for division using the multiplication tables that they know, including for two-digit numbers divided by one-digit numbers, progressing to formal written methods.
Key equipment: Diennes, counters, multi-link. Key concept: Use concrete representations to show the concept of division as sharing equally. Use the strategy of distributing objects equally into groups. Sharing items equally.  Finding the number of groups 	Key equipment: Diennes, counters, multi-link. Key concept: Division is conceptualised as sharing or dividing a set of items into equal groups so that each group has the same number of items. The $\div$ is introduced to children. Division is the inverse of multiplication. 	Key equipment: Diennes, counters, multi-link. Key concept: Division of a 2-digit number by a 1-digit number with a remainder. The long division format is used to divide and find the quotient.(number of items each group contain) and remainder. The divisor is the number of groups. Children relate division with multiplication. Introduce long division showing vertical format. Let's Learn! Quotient and remainder 1 Ella and Tai are at the beach collecting seashells and pebbles. They divide 8 buckets equally between them. a How many buckets does each child get? b How many buckets are left? a $8 \div 2 = ?$  8 ones $\div$ 2 = 4 ones with no remainder Quotient = 4 ones Remainder = 0 ones Each child gets 4 buckets. b There are no buckets left. $\begin{array}{r} 4 \\ 2 \overline{) 8} \\ \underline{8} \\ 0 \end{array}$

Division

Sharing: Finding the number of items in each group

- 1 Divide 12 pencil sharpeners into 2 equal groups.
How many pencil sharpeners are there in each group?



$$12 \div 2 = ?$$



$$\begin{aligned} 2 \times 6 &= 12 \\ 12 \div 2 &= 6 \end{aligned}$$

There are 6 pencil sharpeners in each group.

- 2 Divide 12 spoons into 3 equal groups.
How many spoons are there in each group?



$$12 \div 3 = ?$$

$$\begin{aligned} 3 \times 4 &= 12 \\ 12 \div 3 &= 4 \end{aligned}$$



There are 4 spoons in each group.

Division without remainder and regrouping

- 1 Ella, Peter and Ruby are collecting twigs and acorns in the garden.



They share 63 twigs equally between them.
How many twigs does each child get?

$$63 \div 3 = ?$$

Tens	Ones

First divide the **tens** by 3.
6 tens $\div$ 3 = 2 tens

$$\begin{array}{r} 2 \\ 3 \overline{) 63} \\ \underline{6} \\ 3 \end{array}$$

Tens	Ones

Then divide the **ones** by 3.
3 ones $\div$ 3 = 1 one

$$\begin{array}{r} 21 \\ 3 \overline{) 63} \\ \underline{6} \\ 3 \\ \underline{3} \\ 0 \end{array}$$

So $63 \div 3 = 21$.

Each child gets 21 twigs.

Division with regrouping in tens and ones

1 Peter and Miya are playing cards. They share 52 cards equally between them. How many cards does each child get?



$$52 \div 2 = ?$$

Tens	Ones

First divide the **tens** by 2.
 $5 \text{ tens} \div 2$
 $= 2 \text{ tens with remainder } 1 \text{ ten}$

$$\begin{array}{r} 2 \\ 2 \overline{) 52} \\ \underline{4} \\ 1 \end{array}$$

Tens	Ones

Regroup the remainder ten:
 $1 \text{ ten} = 10 \text{ ones}$
 Add the ones:
 $10 \text{ ones} + 2 \text{ ones} = 12 \text{ ones}$

$$\begin{array}{r} 2 \\ 2 \overline{) 52} \\ \underline{4} \\ 12 \end{array}$$

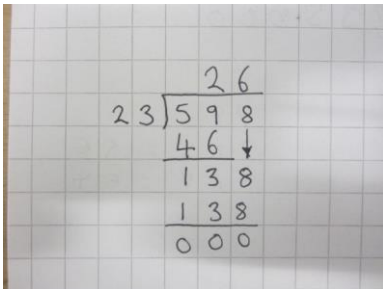
Tens	Ones

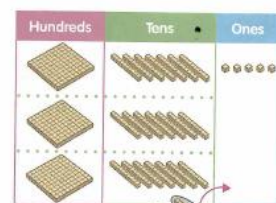
Then divide the **ones** by 2.
 $12 \text{ ones} \div 2 = 6 \text{ ones}$

$$\begin{array}{r} 26 \\ 2 \overline{) 52} \\ \underline{4} \\ 12 \\ \underline{12} \\ 0 \end{array}$$

So $52 \div 2 = 26$.
 Each child gets 26 cards.

DIVISION

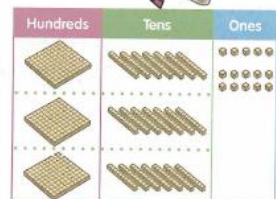
Year 4 Key vocabulary: share, share equally, one each, two each..., group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, quotient, inverse, short division, remainder, multiple, divisible by, factor End of Year Objective: Divide numbers up to 3 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context. Key equipment: Diennes; place value chart Key concept: Expressing a number as a sum of values of different places. Dividing equally without a remainder. Division with regrouping in hundreds, tens and ones 1 Farmer Jones sells his crops to 3 restaurants. He divides 525 cabbages equally between the 3 restaurants. How many cabbages does each restaurant receive? $525 \div 3 = ?$ <table><tr><th>Hundreds</th><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td><td></td></tr></table> First divide the hundreds by 3. $5 \text{ hundreds} \div 3 = 1 \text{ hundred with remainder } 2 \text{ hundreds}$$\begin{array}{r} 1 \\ 3 \overline{) 525} \\ \underline{3} \\ 2 \end{array}$ Regroup the remainder hundreds: $2 \text{ hundreds} = 20 \text{ tens}$ Add the tens: $20 \text{ tens} + 2 \text{ tens} = 22 \text{ tens}$$\begin{array}{r} 1 \\ 3 \overline{) 525} \\ \underline{3} \\ 2 \end{array}$	Hundreds	Tens	Ones				Year 5 Key vocabulary: share, share equally, one each, two each..., group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, inverse, short division, remainder, multiple, divisible by, factor, quotient, End of Year Objective: Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context. Key equipment: Diennes, place value chart Key concept: Using a formal algorithm to divide numbers up to 4 digits by a 1 digit whole number Regrouping is involved in division. <u>Without a remainder.</u> Division by a 1-digit number 1 6381 seeds are planted in plant pots. Each plant pot contains 3 seeds. How many plant pots are there? Step 1 Divide 6 thousands by 3. $6 \text{ thousands} \div 3 = 2 \text{ thousands} = 2000$ Step 2 Divide 3 hundreds by 3. $3 \text{ hundreds} \div 3 = 1 \text{ hundred} = 100$ Step 3 Divide 8 tens by 3. $8 \text{ tens} \div 3 = 2 \text{ tens with remainder } 2 \text{ tens} = 20 \text{ with remainder } 20$ Step 4 Divide 21 ones by 3. $21 \text{ ones} \div 3 = 7 \text{ ones} = 7$ When 6381 is divided by 3, the quotient is 2127 and the remainder is 0. There are 2127 plant pots.	Year 6 share, share equally, one each, two each..., group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, inverse, short division, remainder, multiple, divisible by, factor, quotient, End of Year Objective: Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context. Use written division methods in cases where the answer has up to two decimal places. <u>Key concept:</u> Using a formal algorithm to divide numbers up to 4 digits by a 2 digit whole number to include remainders. Regrouping is involved in division. Without a remainder: Step 1 $2 \times 23 = 46$ Step 2 $59 - 46 = 13$. Bring down The 8. Step 3 $6 \times 23 = 138$ 
Hundreds	Tens	Ones						



Then divide the **tens** by 3.

22 tens $\div 3$
= 7 tens with remainder 1 ten

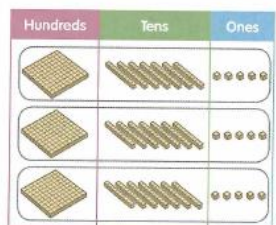
$$\begin{array}{r} 17 \\ 3 \overline{) 525} \\ \underline{3} \\ 22 \\ \underline{21} \\ 1 \end{array}$$



Regroup the remainder ten:
1 ten = 10 ones

Add the ones:
10 ones + 5 ones = 15 ones

$$\begin{array}{r} 17 \\ 3 \overline{) 525} \\ \underline{3} \\ 22 \\ \underline{21} \\ 15 \end{array}$$



Finally divide the **ones** by 3.

15 ones $\div 3$ = 5 ones

$$\begin{array}{r} 175 \\ 3 \overline{) 525} \\ \underline{3} \\ 22 \\ \underline{21} \\ 15 \\ \underline{15} \\ 0 \end{array}$$

So $525 \div 3 = 175$.

Each restaurant receives 175 cabbages.

With a remainder.

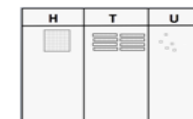
Divide 2634 by 4. Then find the quotient and the remainder.

$$\begin{array}{r} 6 \\ 4 \overline{) 2634} \\ \underline{24} \\ 23 \\ \underline{20} \\ 34 \\ \underline{32} \\ 2 \end{array}$$

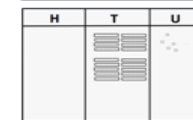
6×4 5×4 8×4

When 2634 is divided by 4, the quotient is **658**
and the remainder is **2**.

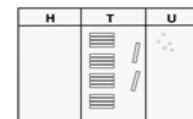
In Year 6, children will be introduced to the short division method, initially backed up by place value to support.



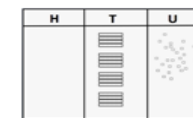
For example, $185 \div 4$
using a sharing model
A 100-block cannot be
shared into 4 equal
groups



So the 100-block must be
exchanged for ten ten-
sticks - so there are now
18 ten-sticks



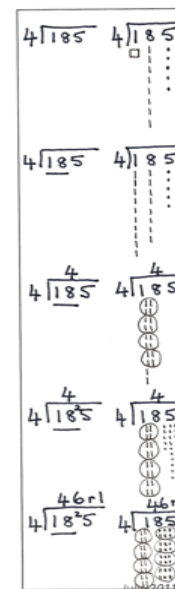
Now the 18 tens can be
shared equally into 4
groups, with 4 in each
group.



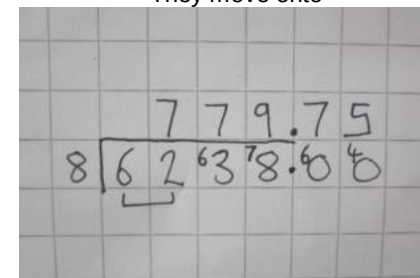
These must be exchanged
for units - now there are
25 units



Now the 25 tens can be
shared into 4 equal groups
with 6 in each group.
There is one remaining
unit.
The answer is $46 \text{ r } 1$.



They move onto



Children add some zeros after the decimal point and continue to work exchanging the remainders so that the answer becomes a decimal.

Children understand that 2.75 is the same as $2 \frac{3}{4}$

or $1 \frac{1}{4}$ is the same as 1.25

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