# Lesson 5: Multiplying with Regrouping

Textbook pages: 147 – 148

Book Contents

## Lesson Objective

To be able to multiply a 2-digit number by a 1-digit number with regrouping, using the standard algorithm.

**Lesson Approach**

To begin this lesson, show pupils the In Focus task. Ask them whether Hannah is correct in saying that 47 × 4 is 188. Allow pupils time to find the answer for 47 × 4 using the expanded column method learnt in the previous lessons and the number bond method. Show the expanded column method beside Hannah's method. Ask pupils to explain what Hannah does that is different to what they have been doing in the previous lessons. Use manipulatives to show them that 7 ones times 4 is 28, which is 2 tens and 8 ones. We can see the 8 ones in the answer row but what did Hannah do with the 2 tens? Instead of putting it in the answer row, she has put 2 in the tens column. Why did she do that? It reminds her to add 2 tens to the product of the tens and 4. Guide pupils to see that Hannah's method is essentially the same as the expanded method, but it saves time and space.

Ask pupils to find the product of 23 and 8 using Hannah's method. Allow them enough time, with the use of manipulatives, to show you Hannah's method for this question. Allow them to connect what they have used in previous lessons with Hannah's method so they can understand the link.

During Guided Practice, pupils are multiplying using the column method.

**Misconceptions**

Pupils add the tens and then multiply, rather than the other way round.

**Formative Assessment**

Pupils can decompose a 2-digit number by tens and ones.
Pupils can multiply ones by a 1-digit number.
Pupils can multiply tens by a 1-digit number.
Pupils can show the multiplication process using the expanded column method.
Pupils can show the multiplication process using the standard column method.

**Non-Negotiable**

Pupils can multiply a 2-digit by a 1-digit number using the expanded column method.

**Variation**

Example 1: Regrouping into the tens required.
Example 2: Regrouping into the tens and then into hundreds required.

**National Curriculum**

Write and calculate mathematical statements for multiplication using the multiplication tables that they know, including for 2-digit numbers times 1-digit numbers, using mental and progressing to formal written methods.

**Resources**

* Base 10 materials (between two)
* Place-value charts (between two)
* Laminated part–whole diagrams (one between two)

# Lesson 6: Simple Dividing

Textbook pages: 149 – 150

Book Contents

## Lesson Objective

To be able to divide a 2-digit number by a 1-digit number without regrouping.

**Lesson Approach**

To begin this lesson, show pupils the In Focus task. Allow them to use Base 10 materials so they can see how they could share 68 sweets between two children. Gather the different methods the class has used. Explain that we can share the sweets firstly by thinking of the sweets in terms of tens and ones. How many tens do we need to represent 68? How many ones? Using Base 10 materials, ask the class if we can share the tens by 2: 6 tens, which is 60, divided by 2 gives us 3 tens each, which is 30. So the two children will both receive 3 tens = 30 sweets. Ask pupils what they think we have to do next. Share the ones? How many ones are there in 68? How many will each child receive if we share 8 ones between them?

During Guided Practice, pupils are using number bonds as the key strategy to solve the problems.

**Misconceptions**

Pupils believe that sharing equally means each group receives about the same number of items rather than exactly the same.

**Formative Assessment**

Pupils can decompose a 2-digit number by tens and ones.
Pupils can divide tens by a 1-digit number.
Pupils can divide ones by a 1-digit number

**Non-Negotiable**

Pupils can divide a 2-digit number by a 1-digit number without regrouping.

**Variation**

Example 1: Dividing an even number by an even number; number bond suggested.
Example 2: Dividing an odd number by an odd number; number bond suggested.
Example 3: Dividing when the divisor doubles.
Example 4: Similar to example 2; no method suggested.

**National Curriculum**

Write and calculate mathematical statements for division using the multiplication tables that they know, including for 2-digit numbers times 1-digit numbers, using mental and progressing to formal written methods. Solve problems, including missing number problems, involving division.

**Resources**

* Objects for counting
* Base 10 materials (between two)
* Place-value charts (between two)
* Laminated part–whole diagrams (one between two)

# Lesson 7: Dividing with Regrouping

Textbook pages: 151 – 152

Book Contents

## Lesson Objective

To be able to divide a 2-digit number by a 1-digit number with regrouping.

**Lesson Approach**

To begin this lesson, show pupils the In Focus task. Allow them time to work this out using the methods they already know, then go through the methods the class has suggested. Explain you can break 52 into two parts so that it is easier to share. Using Base 10 materials, ask pupils to share the 5 tens into the 4 boxes equally. Some pupils may start to share one at a time and others will say they cannot share it equally.

Ask pupils what is left over if each box has 1 ten. We have 1 ten and 2 ones left. How much is 1 ten and 2 ones altogether? How can we share 12 between the 4 groups? Ask the class to share 12 between the 4 boxes by using ones to represent the 12. We can divide the 12 ones into the 4 boxes. Each box will have 3 ice creams when we divide 12 by 4. Altogether we divided 52 by 4 and we ended up with each box having 10 + 3 ice creams, which is 13 ice creams. Allow pupils to work with one another to find different ways to do this. Tell them your friend said that finding multiples of 10 of the divisor is helpful when working with bigger numbers. What does this mean? Does it always work?

During Guided Practice, pupils are solving division questions using the number bond strategy.

**Watch the Film**

**Misconceptions**

Pupils believe that sharing equally means each group receives about the same number of items rather than exactly the same. Pupils do not think that hundreds and tens can be regrouped as they are stuck together in the form of Base 10 materials.

**Formative Assessment**

Pupils can decompose a 2-digit number by multiples of 10 of the divisor and the remainder.
Pupils can divide the multiples of 10 of the divisor by the divisor.
Pupils can divide the remainder by the divisor.

**Non-Negotiable**

Pupils can divide a 2-digit number by a 1-digit number with regrouping, using concrete materials and number bonds.

**Variation**

Examples (a) and (b): Regrouping required; number bond shows the most efficient way to divide the number.
Examples (c) and (d): Regrouping required; how to divide the number is not suggested.
Example (e): Regrouping required; no suggested method.

**National Curriculum**

Write and calculate mathematical statements for division using the multiplication tables that they know, including for 2-digit numbers times 1-digit numbers, using mental and progressing to formal written methods. Solve problems, including missing number problems, involving division.

**Resources**

* Base 10 materials (between two)
* Laminated part–whole diagrams (one between two)

# Lesson 8: Dividing with Regrouping

Textbook pages: 153 – 154

Book Contents

[Go to Workbook](https://hub.mathsnoproblem.com/teacher-guides/england/workbook-3a/chapter-04/worksheet-8)

## Lesson Objective

To be able to divide a 2-digit number by a 1-digit number with regrouping, using the standard algorithm.

**Lesson Approach**

To begin this lesson, show pupils the In Focus task. Ask them to solve 96 divided by 8 using every method they know, then show their solutions. Compare their answers to Charles' and ask them if they can see what he is doing. Tell pupils your friend said that Charles is using number bonds. What does she mean by this? Is this possible? Can we compare? Ask pupils what 96 can be split into (if we were using number bonds) so that you can easily divide by 8. 80 and 16 would be a good way to split 96 so that we can easily divide the 80 by 8, and then 16 by 8.

Can you see an 80 in the method that Charles is using? How many tens are there when 80 is divided by 8? There will be 1 ten. Can you see the 1 ten in Charles' method? Can you see a 16 in Charles' method? How many ones are there when 16 is divided by 8? There will be 2 ones. Can you see the 2 ones in his method? So 96 divided by 8 is 12.

During Guided Practice, pupils are dividing 2-digit numbers by a 1-digit number. They should practise division using number bonds and long division.

**Misconceptions**

Pupils are not sure where to place the numbers in the long division method

**Formative Assessment**

Pupils can decompose a 2-digit number by multiples of 10 of the divisor and the remainder.
Pupils can divide the multiples of 10 of the divisor by the divisor.
Pupils can divide the remainder by the divisor.
Pupils can use the long division method to divide a 2-digit number by a 1-digit number.

**Non-Negotiable**

Pupils can divide a 2-digit number by a 1-digit number with regrouping, using the long division method, supported by number bonds.

**Variation**

Examples 1–5: Dividing 2-digit numbers by 2, 3, 4 and 5; long division is the suggested method.

**National Curriculum**

Write and calculate mathematical statements for division using the multiplication tables that they know, including for 2-digit numbers times 1-digit numbers, using mental and progressing to formal written methods. Solve problems, including missing number problems, involving division.

**Resources**

* Laminated part–whole diagrams (between two)
* Base 10 materials (between two)

# Lesson 9: Solving Word Problems

Textbook pages: 155 – 157

Book Contents

## Lesson Objective

To be able to solve word problems involving multiplication.

**Lesson Approach**

To begin this lesson, show pupils the In Focus task and discuss the problem with them. What key information is given? 18 blue crayons; twice as many green crayons. What is the problem asking us to find? The number of green crayons; the total number of crayons. Allow them some time to work on this.

Can we represent the problem using bar models? Begin moving pupils in this direction through questioning, giving them time to work it out for themselves. Only use questioning when pupils are unable to move forward on their own. How can we draw the bars to represent the crayons? Which one should be larger? Use coloured paper or card to represent the bar for the blue crayons. How large should we make the bar for the green crayons? Having the same sized bar for both colours means we have the same amount, so we need the green bar to be bigger.

The problem says there are twice as many green crayons as blue crayons, so we need to have two bars which are each the same size as one blue bar. What value does the blue bar represent? So how can we work out the value of the green bar? It is twice as big as the blue bar: 18 × 2. How can we multiply 18 by 2? (10 × 2) + (8 × 2). Therefore, the number of green crayons is 20 + 16 = 36.

What calculation do we need to do to work out how many crayons there are altogether? There are 18 blue crayons and 36 green crayons. So we can add the amount of crayons together to find the total. 18 + 36 will give us the total number of crayons. Work through Let's Learn 2 in the same way.

During Guided Practice, pupils are solving word problems using the bar model.

**Misconceptions**

Pupils cannot relate the use of different operations at different stages of the solution for a multi-step problem.

**Formative Assessment**

Pupils can draw identical bars to represent the problem.
Pupils can label bar models appropriately with information from the problem.
Pupils can determine which operation to use based on the visual representation through bar modelling and keywords in the problem.

**Non-Negotiable**

Pupils can solve 2-part problems involving multiplication.

**Variation**

Example 1: Representing Ravi with 1 unit and Holly with 3; comparative model needed.
Example 2: Understanding there are 8 berries in each box not 4.
Example 3: Understanding there are 7 pieces per paper.

**National Curriculum**

Solve problems, including missing number problems, involving multiplication and division.

# Lesson 10: Solving Word Problems

Textbook pages: 158 – 159

Book Contents

[Go to Workbook](https://hub.mathsnoproblem.com/teacher-guides/england/workbook-3a/chapter-04/worksheet-10)

## Lesson Objective

To be able to solve word problems involving division.

**Lesson Approach**

To begin this lesson, show pupils the In Focus task and discuss the problem with them. Ask them what information is given and what they have to find. Ask pupils how they could draw a model to represent the problem. Give them some time to draw the model and select a few to highlight the appropriate representation, numbering and labelling. Then ask pupils how they can find out what one bar would be equal to? Which operation will help us to do that? So what can we say about the number of beads Sam has? If we know how many Emma and Sam have, how can we work out the total?

During Guided Practice, pupils are solving word problems using the bar model.

**Misconceptions**

Pupils cannot relate the use of different operations at different stages of the solution for a multi-step problem.

**Formative Assessment**

Pupils can draw identical bars to represent the problem.
Pupils can label bar models appropriately with information from the problem.
Pupils can determine which operation to use based on the visual representation through bar modelling and keywords in the problem.

**Non-Negotiable**

Pupils can solve 2-part word problems involving division.

**Variation**

Example 1: Representing the girls as 1 unit and the boys as 3; knowing there 78 boys.
Example 2: Solving a multi-step word problem involving specific use of language; using the working backwards strategy.
Example 3: Solving a 2-part word problem involving a combination of operations.

**National Curriculum**

Solve problems, including missing number problems, involving multiplication and division.

# Lesson 11: Solving Word Problems

Textbook pages: 160

Book Contents

[Go to Workbook](https://hub.mathsnoproblem.com/teacher-guides/england/workbook-3a/chapter-04/worksheet-11)

## Lesson Objective

To be able to solve multi-step word problems involving division.

**Lesson Approach**

To begin this lesson, show pupils the In Focus task and discuss the problem with them. Determine which character has more and who has less by identifying the key information provided. Help pupils to make the problem less complex by comparing the number of marbles 2 boys have first. So far pupils have only been exposed to a 2-bar comparison model. In this problem, they will have to draw 3 bars to compare 3 quantities. Ask pupils to try drawing the model and suggest they start by comparing the number of marbles that Sam and Ravi have.

After they have had some time to work on the problem, ask pupils how many characters there are in the question. Suggest that the comparison between Ravi and Elliot can be drawn by adding one more bar, which is Elliot's marbles. Once they have completed the model, go through the solution with them. In this problem, the extra 2 marbles must be subtracted from the total to make all the units equal so that we can use division to find 1 unit, which is the number of marbles Ravi has.

During Guided Practice, pupils are solving complex word problems using the bar model.

**Misconceptions**

Pupils are unsure how to represent word problems using bar models.

**Formative Assessment**

Pupils can draw identical bars to represent the problem.
Pupils can label bar models appropriately with information from the problem.
Pupils can determine which operation to use based on the visual representation through bar modelling and keywords in the problem

**Non-Negotiable**

Pupils can solve multi-step word problems involving division.

**Variation**

Example 1: Using a comparison model to represent the problem and a combination of operations to solve it.
Example: Using a comparison model; making the units equal, then finding 1 unit; using a combination of operations to solve the problem.

**National Curriculum**

Solve problems, including missing number problems, involving multiplication and division.

# Lesson 12: Chapter Consolidation

Textbook pages: 161 – 162

Book Contents

[Go to Workbook](https://hub.mathsnoproblem.com/teacher-guides/england/workbook-3a/chapter-04/mind-workout)

## Lesson Objective

To be able to use knowledge of multiplication and division to solve problems.

**Lesson Approach**

Mind workout
Pupils solve a complex word problem involving division.

Maths Journal
Pupils complete a word problem using the format given.

Self Check
Pupils complete this as a chapter summary and discuss what to do with their teacher if any boxes are not ticked.