

## Unit 2 Multiplication and division 1

Five daily lessons

*National*  
**Numeracy Strategy**

Year 5  
Summer term

### Unit Objectives

#### Year 5

- Begin to express a quotient as a fraction, or as a decimal when dividing a whole number by 2, 4, 5 or 10, or when dividing £.p. Round up or down after division, depending on the context.
- **Use all four operations to solve simple word problems involving numbers and quantities**, based on 'real life' money and measures **including** using one or more steps and making simple conversions of pounds to foreign currency. Explain methods and reasoning.

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This Unit Plan is designed to guide your teaching. You will need to adapt it to meet the needs of your class.

### Resources needed to teach this unit:

- Resource sheet 2.1
- Activity sheet 2.1
- Activity sheet 2.2
- OHP calculator
- Whiteboards
- 1–100 digit cards

### Link Objectives


#### Year 4

#### Year 6

- **Find remainders after division.** Divide a whole number of pounds by 2, 4, 5 or 10 to give £.p. Round up or down after division, depending on the context. Use all four operations to solve word problems involving numbers in 'real life'.
- **Choose and use appropriate number operations and appropriate ways of calculating (mental, mental with jottings, pencil and paper) to solve problems.**
- Explain methods and reasoning.

- Express a quotient as a fraction or as a decimal rounded to one decimal place. Divide £ and p by a two-digit number to give £.p. Round up or down after division, depending on the context.
- **Identify and use appropriate operations (including combinations of operations) to solve word problems involving numbers and quantities.**
- Choose and use appropriate number operations to solve problems and appropriate ways of calculating: mental, mental with jottings, written methods, calculators.
- **Explain methods and reasoning.**

(Key objectives in bold)

Planning sheet	Day One	Unit 2 <i>Multiplication and division 1</i>	Term: <i>Summer</i>	Year Group: 5
Oral and Mental	Main Teaching			Plenary
Objectives and vocabulary	Teaching Activities	Objectives and vocabulary	Teaching Activities	Teaching Activities/Focus Questions
<p>Use doubling and halving to multiply or divide two-digit numbers by 4.</p> <p>VOCABULARY double halve</p> <p>RESOURCES Whiteboards</p>	<ul style="list-style-type: none"> <li>Ask the children to tell you some two-digit numbers, write these numbers on the board.</li> </ul> <p>Tell the children that you are going to point to a number and they have to multiply and divide the number by 4 and write the answers on their whiteboards. Point to an even number first.</p> <p><b>Q</b> Who used doubling and halving to solve the problem?</p> <p>Tell the children that you want them all to use doubling and halving for the next one. Point to another even number.</p> <p><b>Q</b> How did you find the answers to this one?</p> <p>Now point to an odd number.</p> <p><b>Q</b> How did you find the answer to this one?</p>	<p>Begin to express a quotient as a fraction or as a decimal when dividing a whole number by 2, 4, 5, or 10p when dividing £ and p.</p> <p>VOCABULARY quotient fraction decimal</p>	<ul style="list-style-type: none"> <li>Tell the children the meaning of the word quotient – ‘The answer from a division calculation’.</li> </ul> <p><b>Q</b> What is the quotient of <math>17 \div 4</math>?</p> <ul style="list-style-type: none"> <li>Establish that the answer is 4 R 1.</li> </ul> <p><b>Q</b> What does this answer mean?</p> <p>Explain that the answer means that the 17 has been divided into 4 groups and that the remainder of 1 should also be divided between 4.</p> <p>Show the calculation <math>17 \div 4</math> on the empty number line.</p>  <p>Explain that four groups are represented by the 4 in the answer to the calculation. Point to the remainder of 1 out of a jump of 4.</p> <p><b>Q</b> What fraction of the jump is the remainder of 1?</p> <p>Establish that the remainder is <math>\frac{1}{4}</math> of the jump size.</p> <p>Demonstrate how to calculate <math>17 \div 5</math>. Use the empty number line to show how the answer could be 3 R 2, <math>3\frac{2}{5}</math>.</p> <p><b>Q</b> What is <math>\frac{2}{5}</math> as a decimal?</p> <p>Write some TU and HTU numbers on the board. Tell the children they have to work in pairs to divide each number by 2, 4, 5 and 10 and write the answers both as a fraction and a decimal.</p> <p>Ask the children for the strategies they used to get their answers.</p> <p><b>Q</b> Did anyone use the strategy of halving and quartering?</p> <p>Give the children this problem: It costs £5.40 for four children to go swimming. How much does it cost each child? Ask the children to discuss in pairs how they found the answer to this problem.</p> <p><b>Q</b> What strategies did you use to find the answer?</p> <p>Give the children some simple money problems that involve dividing by 2, 4 and 10.</p>	<p><b>Q</b> Which of the calculations you did were difficult?</p> <p>Discuss the children’s responses and the difficulties they faced.</p> <p><b>Q</b> What number have I halved to get a quotient of <math>61\frac{1}{2}</math>?</p> <p><b>Q</b> What number have I quartered to give a quotient of 22.25?</p> <p><b>By the end of the lesson the children should be able to:</b></p> <ul style="list-style-type: none"> <li><b>Begin to give a quotient as a fraction when dividing by a whole number;</b></li> <li><b>Begin to give a quotient as a decimal fraction.</b></li> </ul> <p>(Refer to supplement of examples, section 6, page 57.)</p>

Planning sheet	Day Two	Unit 2 <i>Multiplication and division 1</i>		Term: <i>Summer</i>	Year Group: 5
Oral and Mental		Main Teaching			Plenary
Objectives and vocabulary	Teaching Activities	Objectives and vocabulary	Teaching Activities	Teaching Activities/Focus Questions	
<p>Round decimals to the nearest whole number.</p> <p>VOCABULARY decimal place round</p>	<ul style="list-style-type: none"> <li>Write 2 on the board. Ask the children to write a number on their whiteboards that when rounded to one decimal place would give the answer 2. Record the children's answers on the board.</li> </ul> <p><b>Q</b> Why do these numbers round to 2?</p> <p><b>Q</b> Can you think of any two decimal place numbers that round to 2?</p> <ul style="list-style-type: none"> <li>Use whiteboards to show some numbers that round to 16.</li> </ul>	<p>Round up or down after division, depending on the context.</p> <p>VOCABULARY round up round down</p> <p>RESOURCES OHP calculators Calculators</p>	<ul style="list-style-type: none"> <li>Present the following problem: I have saved £240. A train ticket costs £52. How many tickets can I buy?</li> </ul> <p><b>Q</b> What calculation do we need to solve the problem?</p> <p>Establish that the calculation will be <math>240 \div 12</math>. Enter the calculation into the OHP calculator and ask the children to do the same on their calculators.</p> <p>Ensure that all the children have the same answer as on the OHP calculator.</p> <p><b>Q</b> What does 4.615384 mean?</p> <p>Remind the children that the calculation when represented on a number line would be 4 and a bit jumps.</p> <p><b>Q</b> How many times does 52 divide into 240?</p> <p>Establish the answer of 4.615384 means that 52 divides into 240 four times with a remainder.</p> <p>Remind the children that the question asks how many tickets costing £52 can be bought.</p> <p><b>Q</b> How much will it cost to buy four tickets?</p> <p>Establish that four tickets would cost £208.</p> <p><b>Q</b> How much would it cost to buy five tickets?</p> <p>Establish that the cost of five tickets would cost £260.</p> <p>Explain that the answer 4.615384 means that £240 is more than enough to buy four tickets but insufficient to buy five tickets.</p> <p>Tell the children that this is an example of rounding down. Give the children these problems to solve in pairs with the calculators:</p> <ol style="list-style-type: none"> <li>I have 240 cakes. One box holds 52 cakes. How many full boxes can I fill? How many boxes would I need for all the cakes?</li> <li>A school has 250 children and they are all going on a trip together. A coach can hold 52 people. How many coaches are needed?</li> <li>I have 5 metres of ribbon and I need lengths of 865 cm for the Summer Fayre stalls. How many of these lengths can I get from my ribbon?</li> <li>5000 football fans are going to a match. Each stand at the football ground can hold 865 people. How many stands will the fans need?</li> </ol> <p>For each of the questions ask the children to interpret the calculator display. Ensure that they are able to understand the decimal remainder in the context of the question.</p> <p>Give answers to the remaining questions.</p>	<ul style="list-style-type: none"> <li>Ask the children to work with a partner and devise their own problem that involves rounding down.</li> </ul> <p>Ask pairs to read out their problem and get the rest of the class to solve the problem.</p> <p><b>Q</b> How could we change this question (choose one) to make it rounding up instead of down?</p> <p><b>By the end of the lesson the children should be able to:</b></p> <ul style="list-style-type: none"> <li><b>Decide what to do after a division, and round up or down accordingly;</b></li> <li><b>When dividing with a calculator, interpret the quotient displayed.</b></li> </ul> <p>(Refer to supplement of examples, section 6, page 57.)</p>	

Planning sheet	Day Three	Unit 2 <i>Multiplication and division 1</i>		Term: <i>Summer</i>	Year Group: 5
Oral and Mental		Main Teaching			Plenary
Objectives and vocabulary	Teaching Activities	Objectives and vocabulary	Teaching Activities	Teaching Activities/Focus Questions	
<p>Add and subtract any pair of two-digit numbers, including crossing 100.</p> <p>VOCABULARY add more plus increase subtract take away minus decrease</p> <p>RESOURCES 1–100 digit cards</p>	<ul style="list-style-type: none"> <li>Use number cards 10 to 100 to make addition and subtraction calculations. Create calculations that cross the hundreds boundary.</li> </ul> <p>Get the children to show their answers on their whiteboards.</p> <p>Discuss the strategies used by the children.</p>	<p>Use all four operations to solve simple word problems involving numbers and quantities.</p> <p>Choose and use appropriate number operations to solve problems.</p> <p>Explain methods and reasoning.</p> <p>VOCABULARY multiplication addition operation calculation</p> <p>RESOURCES Activity sheet 2.1 Activity sheet 2.2 Resource sheet 2.2</p>	<p>Give out copies of Activity sheet 2.1, one between two. Get the children to identify the problems according to the operation that is required to solve them by cutting up the Resource sheet and sorting the problems into groups.</p> <p><b>Q</b> Which problems could be done by multiplication or addition?</p> <p><b>Q</b> What would be more efficient, multiplication or addition?</p> <p>Go through all the questions with the children, making sure that everyone has the correct operation/s.</p> <p>Let the children work through the questions, finding the correct answers.</p> <p>Go through the answers with the children.</p> <p><b>Q</b> What calculation methods did you use?</p> <p>Repeat the above with Activity sheet 2.2, which has multi-step problems on it.</p> <p>Explain that the problems on this sheet require more than one calculation to solve the problem – these problems have to be solved in two or more steps.</p> <p>Ask the children to work in pairs to sort these problems by the calculation required for the first step.</p> <p>Discuss the problems that can be solved by using the operation of addition for the first step.</p> <p>Ask the children to choose a calculation from this set.</p> <p><b>Q</b> What is the second operation for the problem you chose?</p> <p>Discuss the children's responses and correct any errors.</p>	<ul style="list-style-type: none"> <li>Go through the answers to Resource sheet 2.2 with the children. For each question ask:</li> </ul> <p><b>Q</b> What calculation methods did you use?</p> <p><b>Q</b> Do you think you used the most efficient method?</p> <p>HOMEWORK – Ask the children to invent some 'I'm thinking of a number' problems for themselves. These problems must involve at least two operations.</p> <p><b>By the end of the lesson the children should be able to:</b></p> <ul style="list-style-type: none"> <li>Solve 'story' problems about numbers in 'real life' choosing the appropriate operation and method of calculation;</li> <li>Explain and record using numbers, signs and symbols how the problem was solved.</li> </ul> <p>(Refer to supplement of examples, section 6, page 83.)</p>	

Planning sheet	Day Four	Unit 2 <i>Multiplication and division 1</i>	Term: <i>Summer</i>	Year Group: 5
Oral and Mental		Main Teaching		Plenary
Objectives and vocabulary	Teaching Activities	Objectives and vocabulary	Teaching Activities	Teaching Activities/Focus Questions
<p>Know by heart all multiplication facts up to 10 x 10.</p> <p>VOCABULARY product multiplied by times</p> <p>RESOURCES Resource sheet 2.1</p>	<ul style="list-style-type: none"> <li>Use Resource sheet 2.1 to make a set of 'Follow-me' cards. Use the cards to practise rapid recall of tables up to 10 x 10.</li> </ul>	<p>Use all four operations to solve simple word problems involving numbers and quantities.</p> <p>Choose and use appropriate number operations to solve problems.</p> <p>Explain methods and reasoning.</p> <p>VOCABULARY calculation</p>	<ul style="list-style-type: none"> <li>Review the homework. Select a few of the 'I'm thinking of a number' questions for the class to work out. Do this by asking:               <div>Q Who thinks they have thought of the most difficult question?</div> <div>Q Why do you think the question is difficult?</div> <p>Discuss the children's responses and establish why some calculations are more difficult than others.</p> <ul style="list-style-type: none"> <li>Write on the board:                   <div>25 x 3                      + 12</div> </li> </ul> <div>Q Who can think of a word problem that uses these calculations?</div> <p>Get the children in pairs to devise a problem that uses the two calculations. Take feedback from the children about their word problem. Explain to the children that the problem is a multi-step problem.</p> <div>Q What are the most important words in your problem?</div> <p>Discuss the children's responses and establish the words that are linked to the calculation.</p> <p>Get the children to work in pairs to create problems using the following calculations. Explain to the children that they should identify the most important words for each example.</p> <div> <div>1) 500 ÷ 2                      + 80</div> <div>2) add 17                      multiply by 6</div> <div>3) 10 x 25 x 5</div> <div>4) 150 ÷ 3                      49</div> </div> </li> </ul>	<ul style="list-style-type: none"> <li>Go through each of the questions asking the children to read out some of the problems they have found.               <div>Q Which of the questions was the easiest to think of a word problem for and why?</div> <div>Q Which was the hardest question to think of a word problem for and why?</div> <div> <p><b>By the end of the lesson the children should be able to:</b></p> <ul style="list-style-type: none"> <li>Solve 'story' problems about numbers in 'real life', choosing the appropriate operation and method of calculation;</li> <li>Explain and record using numbers, signs and symbols how the problem was solved;</li> <li>Make up number stories to reflect statements.</li> </ul> <p>(Refer to supplement of examples, section 6, pages 75 and 83.)</p> </div> </li> </ul>

Planning sheet	Day Five	Unit 2 <i>Multiplication and division 1</i>		Term: <i>Summer</i>	Year Group: 5
Oral and Mental		Main Teaching			Plenary
Objectives and vocabulary	Teaching Activities	Objectives and vocabulary	Teaching Activities	Teaching Activities/Focus Questions	
<p>Use tests of divisibility.</p> <p>VOCABULARY divisibility divisible</p>	<ul style="list-style-type: none"> <li>A number is divisible by 4 if the last two digits are divisible by 4.</li> </ul> <p>Write 2?? on the board.</p> <p>Ask the children to replace the ?? with digits so that the number is divisible by 4.</p> <p><b>Q</b> How many numbers can you find?</p> <p>Write 23?? on the board and repeat the activity.</p> <p><b>Q</b> Is there a connection between the two sets of answers?</p> <p><b>Q</b> What other tests of divisibility do you know?</p> <p>Remind the children of the tests of divisibility for 5, 10 and 3, illustrating each test with an example.</p>	<p>Choose and use appropriate number operations to solve problems.</p> <p>Explain methods and reasoning.</p> <p>VOCABULARY total operation consecutive numbers</p> <p>RESOURCES Calculators OHT 2.1</p>	<ul style="list-style-type: none"> <li>Present the following problem: A hotel has nine floors and on each floor there are 12 bedrooms apart from the third floor where there are only eight bedrooms. How many bedrooms are in the hotel?</li> </ul> <p>Write on the board the following expression:</p> <p><math>(12 \times 9) - 4</math> and explain that this is a solution that a child has presented.</p> <p>Ask the children in pairs to discuss the method that has been used.</p> <p><b>Q</b> Can you find another way to solve the problem?</p> <p>Say that 90 of the rooms are double rooms and that the other rooms are single rooms.</p> <p><b>Q</b> What is the maximum number of people the hotel can accommodate?</p> <p>Establish that the maximum number of people would be <math>90 \times 2 + 14</math>.</p> <p>Now explain that one evening a party of 27 people arrives. Ask the children to work in pairs to answer the following question.</p> <p><b>Q</b> What are the maximum and minimum number of rooms the 27 people can occupy?</p> <p>Remind the children of the information that we have used so far. The hotel has 90 double rooms and 14 single rooms. Ask the children to use this information to think of a question that will require two steps to solve. Say that they can add some more information as in the example above.</p>	<ul style="list-style-type: none"> <li>Ask the children to share their problems and to discuss strategies for solving the problem.</li> <li>Let the children use calculators to solve these two problems.</li> </ul> <p><b>Q</b> What two consecutive numbers have a product of 182? (13, 14)</p> <p><b>Q</b> What three consecutive numbers have a total of 333? (109, 110, 111)</p> <p><b>Q</b> How did you decide which numbers to try?</p> <p><b>By the end of the lesson the children should be able to:</b></p> <ul style="list-style-type: none"> <li>Choose the appropriate operations to solve word problems and number puzzles;</li> <li>Explain and record how the problem was solved;</li> <li>Solve puzzles and problems.</li> </ul> <p>(Refer to supplement of examples, section 6, pages 75 and 79.)</p>	

63  
END  
  
START  
 $6 \times 7$

42  
  
The product  
of  
 $4 \times 7$

28  
  
 $9 \times 5$

45  
  
Six  
multiplied by  
eight

48  
  
  
  
8 times 7

56  
  
  
  
 $9 \times 9$

81  
  
The product  
of 3 and 6

18  
  
  
  
 $5 \times 5$

25  
  
  
  
 $9 \times 8$

72  
  
  
  
 $4 \times 3$

12  
  
  
  
 $7 \times 5$

35  
  
  
  
 $10 \times 8$

80  
  
  
  
 $9 \times 6$

54  
  
Eight  
multiplied by  
eight

64  
  
The product  
of 3 and 7

21  
  
  
  
 $10 \times 7$

70

 $8 \times 3$ 

24

 $7 \times 2$ 

14

 $5 \times 10$ 

50

 $8 \times 4$ 

32

The product  
of 9 and 3

27

 $3 \times 5$ 

15

 $10 \times 9$ 

90

 $2 \times 7$ 

14

 $10 \times 3$ 

30

 $6 \times 10$ 

60

 $4 \times 4$ 

16

 $9 \times 4$ 

36

 $5 \times 8$ 

40

 $7 \times 7$ 

49

 $9 \times 7$



1. I think of a number and divide it by 15. The answer is 20. What was my number?
2. A bus seats 52 people. No standing is allowed. 17 people get off a full bus. How many were left on?
3. Kobi saved 15p a week for one year. How many pounds did he save?
4. Four people paid £72 for tickets to a football match.
  - a) What was the cost of each ticket?
  - b) How much change did they get from £100?
5. Petrol costs 71.2p per litre. How much do you pay to fill a 5-litre can?
6. There is 365 ml of milk in a jug. Another 450 ml is added. How much milk is there in the jug now?
7. A football club has 400 litres of soup for its fans. One cup holds 250 ml of soup. How many fans can have a cup of soup?
8. A full bucket holds  $5\frac{1}{2}$  litres of water. A full jug holds  $\frac{1}{2}$  litre of water. How many jugs of water will it take to fill the bucket?
9. Dad bought a 2 kg bag of carrots. He used 400 grams to make a carrot cake. How many grams of carrots were left?

1. I have read 134 pages of the 512 pages of my book. How many more pages must I read to reach the middle?
2. There are eight shelves of books. Six of the shelves hold 25 books each. Two of the shelves hold 35 books each. How many books are there altogether on the shelves?
3. I think of a number, subtract 17 and divide by 6. The answer is 20. What was my number?
4. You start to read a book on Thursday. On Friday you read ten more pages than on Thursday to reach page 60. How many pages did you read on Thursday?
5. Ravi bought a pack of 30 biscuits. He ate one fifth of them on Thursday. He ate one eighth of the remaining biscuits on Friday. How many biscuits did he have left?
6. There is space in a multi-storey car park for 15 rows of cars on each floor. There are ten floors. How many cars can the car park hold?
7. I think of a number, subtract 11 and divide by 2. The answer is 20. What was my number?
8. Joan opened a packet of sweets and found that there were 12 in a packet. She had bought six packets. How many sweets could she and her three friends have each?
9. I bought two CD racks that could each hold 35 CDs. I have 87 CDs. How many would not fit in the racks. The racks cost £19.99 each. How much would it cost to buy enough racks for all my CDs?
10. In a school survey of pets, it was found that of the 96 children in Year 6, three quarters had pets. 45 children have a dog. 21 have a cat. How many children have other kinds of pets?

275	382	81	174
206	117	414	262
483	173	239	138
331	230	325	170