

Unit 2

Multiplication and division 1

Five daily lessons

National
Numeracy Strategy

Year 6
Spring term

Unit Objectives Year 6

- Use known facts and place value to consolidate mental multiplication and division. Page 65
- Use the relationship between multiplication and division. Page 63
- Express a quotient as a fraction, or as a decimal rounded to 1 decimal place. Dividing £ and p by a two-digit number to give £ and p. Round up or down after division depending on context. Page 57
- Develop calculator skills and use a calculator effectively. Page 73

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
- Resource sheet 2.2
- Resource sheet 2.3
- OHP
- Calculators
- Target board
- Whiteboards/pens
- 'Follow me' cards
- OHP calculator
- Decimal number cards
- Timer
- Related Key Stage 2 national test questions

Link Objectives

Year 5 Year 7

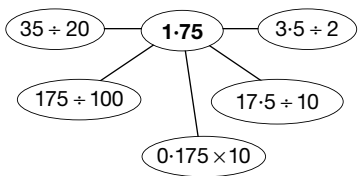
- Use known facts and place value to multiply and divide mentally.
- Use the relationship between multiplication and division.
- Begin to express a quotient as a fraction, or as a decimal when dividing a whole number by 2, 4, 5, 10 or when dividing £.p.
- Round up or down after division depending on the context.
- Develop calculator skills and use a calculator effectively.

- Consolidate and **extend mental methods of calculation to include decimals, fractions and percentages.**
- Enter numbers and interpret the display on a calculator in different contexts.

(Key objectives in bold)

department for
education and skills

Planning sheet	Day One	Unit 2 <i>Multiplication and division 1</i>	Term: <i>Spring</i>	Year Group: 6																																				
Oral and Mental		Main Teaching		Plenary																																				
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities / Focus Questions																																				
Multiply or divide whole numbers by 10, 100, 1000.	<ul style="list-style-type: none">Start with a single-digit number. Ask one child to multiply it by 100. They give the answer and then ask another child to divide this answer by 10, 100 or 1000. Repeat using different starting numbers. Use Resource sheet 2.1 <table><tr><td>3060</td><td>7·9</td><td>101</td><td>42</td><td>1400</td></tr><tr><td>0·79</td><td>1010</td><td>30·6</td><td>14</td><td>28</td></tr><tr><td>4·2</td><td>0·14</td><td>10·1</td><td>79</td><td>420</td></tr><tr><td>306</td><td>7900</td><td>0·042</td><td>0·101</td><td>0·306</td></tr></table> <p>Ask questions like:</p> <div><p>Q I'm thinking of a number on the board that is 100 times smaller than 79. What is it?</p></div> <ul style="list-style-type: none">Invite children to come up with their own questions.	3060	7·9	101	42	1400	0·79	1010	30·6	14	28	4·2	0·14	10·1	79	420	306	7900	0·042	0·101	0·306	Use known facts and place value to multiply and divide decimal numbers mentally.	<ul style="list-style-type: none">Write a decimal number, such as 3·275 on the board. Ask the children to multiply it by 10. Ask children how they did it.Repeat, multiplying and dividing by 10, 100 or 1000.Ask the children to describe what is happening. <div><p>Q What happens to the digits when you multiply or divide by 10, 100 or 1000?</p></div> <ul style="list-style-type: none">Ask the children how to multiply 3·25 by 5. Explain that one strategy is to multiply by 10 and halve. Extend to $\times 50$, $\times 500$, using $\times 100$ and halve and $\times 1000$ and halve.Give the children a range of numbers to multiply by 5, 50 and 500, e.g. $4\cdot65 \times 5$, $1\cdot2 \times 50$, $3\cdot78 \times 500$.Ask the children for the answers and how they worked them out.Show the children how to use doubling and trebling to multiply by 4 and 6. e.g. $44\cdot3 \times 4$ double 88·6 double 177·2 e.g. $44\cdot3 \times 6 =$ $2 \times$ 4 \times 88·6 177·2 $88\cdot6 + 177\cdot2 = 265\cdot8$ Extend to $\times 40$, $\times 600$, etc.Give the children a range of questions to answer such as: $25\cdot5 \times 50$ $7\cdot65 \times 600$Use an OHP calculator to check answers and to discuss the methods. Emphasise the position of the decimal point in the answers.	<ul style="list-style-type: none">Write these numbers on the board. <table><tr><td>1·2</td><td>$76\cdot4 \times 10$</td></tr><tr><td>550</td><td>$0\cdot32 \times 10$</td></tr><tr><td>3·2</td><td>$120 \div 100$</td></tr><tr><td>764</td><td>55×10</td></tr><tr><td>0·12</td><td>$0\cdot555 \times 10$</td></tr><tr><td>5·55</td><td>$32\ 000 \div 100$</td></tr><tr><td>320</td><td>$12 \div 100$</td></tr><tr><td>7·64</td><td>$764 \div 100$</td></tr></table> <ul style="list-style-type: none">Ask children to come out and draw lines between the calculation and the answer. <p>HOMEWORK – Set children multiplication and division questions, e.g. 4·8 multiplied by 5, 50, 500, 4, 6 and 8 and 175 divided by 10, 100 or 1000.</p> <div><p>By the end of the lesson children should be able to:</p><ul style="list-style-type: none">Multiply a decimal fraction with one or two decimal places by 10 or 100;Divide a one- or two-digit whole number by 100 or 10.<p>(Refer to supplement of examples,section 6, page 65.)</p></div>	1·2	$76\cdot4 \times 10$	550	$0\cdot32 \times 10$	3·2	$120 \div 100$	764	55×10	0·12	$0\cdot555 \times 10$	5·55	$32\ 000 \div 100$	320	$12 \div 100$	7·64	$764 \div 100$
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RESOURCES Resource sheet 2.1		VOCABULARY quotient product integer decimal place RESOURCES OHP calculator																																						

Planning sheet	Day Two	Unit 2 <i>Multiplication and division 1</i>	Term: <i>Spring</i>	Year Group: 6
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities / Focus Questions
<p>Recall multiplication and division facts to 10×10.</p> <p>RESOURCES Resource sheet 2.2 'Follow me' cards Timer</p>	<ul style="list-style-type: none"> Use 'follow me' cards on Resource sheet 2.2. Time the class. Swap cards and repeat. 	<p>Use relationship between multiplication and division when working with one and two decimal place numbers.</p> <p>VOCABULARY inverse</p> <p>RESOURCES Calculators</p>	<ul style="list-style-type: none"> Discuss the homework and ask children to write some of their answers on the board. Write 85 on the board and ask the class to divide by 10, 100, 1000. Give other examples. <div>Q What happens to the digits when we divide by 10, 100, 1000?</div> <ul style="list-style-type: none"> Demonstrate the links between dividing by 10, 100, 1000. $\begin{aligned} 85 \div 10 &= 8.5 \\ 85 \div 100 &= 0.85 \\ 85 \div 1000 &= 0.085 \end{aligned}$ Give the children examples to work out dividing by 10, 100 and 1000. Go through the answers with the children and ask how they worked them out. Remind the children of how to work out fact families for decimal numbers, e.g. $\begin{aligned} 3.7 \times 2 &= 7.4 \\ 7.4 \div 2 &= 3.7 \text{ etc.} \end{aligned}$ <p>Give the children examples to work out.</p> With the children work out and record on the board: $\begin{aligned} 24 \div 10 &= 2.4, 2.4 \times 10 = 24 \\ 24 \div 100 &= 0.24, 0.24 \times 100 = 24 \\ 24 \div 1000 &= 0.024, 0.024 \times 1000 = 24 \end{aligned}$ <p>Deduce the division facts</p> $24 \div 2.4 = 10, 24 \div 0.24 = 100, 24 \div 0.024 = 1000$ <div>Q What happens as we divide 24 by smaller numbers?</div>	<ul style="list-style-type: none"> Write on the board $1.75 = 175 \div 100$ With the class construct a spider diagram for 1.75  <p>Emphasise how knowing one number fact can lead to others.</p> <div> <p>By the end of the lesson children should be able to:</p> <ul style="list-style-type: none"> Use the inverse to establish new facts using one- and two-decimal place numbers. <p>(Refer to supplement of examples, section 6, page 63.)</p> </div>

Planning sheet	Day Three	Unit 2 <i>Multiplication and division 1</i>	Term: <i>Spring</i>	Year Group: 6																														
Oral and Mental		Main Teaching		Plenary																														
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities / Focus Questions																														
Know some fractions as decimals and percentages.	<ul style="list-style-type: none">Use Resource sheet 2.3 <table><tr><td>$\frac{1}{2}$</td><td>70%</td><td>40%</td><td>0.3</td><td>0.2</td><td>$\frac{1}{10}$</td></tr><tr><td>0.25</td><td>$\frac{1}{5}$</td><td>0.8</td><td>$\frac{1}{4}$</td><td>$\frac{3}{4}$</td><td>0.6</td></tr><tr><td>20%</td><td>0.7</td><td>30%</td><td>$\frac{3}{5}$</td><td>25%</td><td>0.5</td></tr><tr><td>$\frac{3}{10}$</td><td>75%</td><td>50%</td><td>80%</td><td>0.4</td><td>60%</td></tr><tr><td>0.1</td><td>$\frac{4}{5}$</td><td>$\frac{7}{10}$</td><td>10%</td><td>0.75</td><td>$\frac{2}{5}$</td></tr></table> <p>Point to a number on the board; children have to write an equivalent number from the Resource sheet on their whiteboards.</p> <ul style="list-style-type: none">Draw an empty number line 0 to 1 on the board. Ask the children to stop when your finger has travelled $\frac{3}{4}$ of the way along, then $\frac{2}{5}$, and 20%. Ask for decimal equivalents.Write other numbers on the line: 50 _____ 150 <p>Ask children to say when your finger is halfway. Ask what that number is.</p>	$\frac{1}{2}$	70%	40%	0.3	0.2	$\frac{1}{10}$	0.25	$\frac{1}{5}$	0.8	$\frac{1}{4}$	$\frac{3}{4}$	0.6	20%	0.7	30%	$\frac{3}{5}$	25%	0.5	$\frac{3}{10}$	75%	50%	80%	0.4	60%	0.1	$\frac{4}{5}$	$\frac{7}{10}$	10%	0.75	$\frac{2}{5}$	<p>Expressing the remainder of a quotient as a fraction or decimal fraction when dealing with known facts and familiar times tables.</p> <p>Develop calculator skills.</p> <p>VOCABULARY quotient decimal fraction</p> <p>RESOURCES Calculators Hundred square OHP calculator</p>	<ul style="list-style-type: none">Write $82 \div 8$ on the board. Establish that this is 10 remainder 2. $82 \div 8 = 10 \text{ r } 2$ <div><p>Q How can we express the 2 remainder?</p></div> <p>Use a number line to demonstrate.</p> <p>80 82 88</p> <p>Identify 80 and the next multiple of 8 as 88. Emphasise that as the steps are in 8s, the remainder 2 represents $\frac{2}{8}$ of the step.</p> <p>Write: $82 \div 8 = 10\frac{2}{8}$</p> <p>Demonstrate with further examples counting in multiples of 7 and 9.</p> <ul style="list-style-type: none">Develop this idea using the example: $55 \div 10 = 5\frac{5}{10} = 5.5$. Show children how to convert the fraction to a decimal using a calculator, e.g. $\frac{5}{10} = 0.5$.Model other examples like: $51 \div 4 = 12\frac{3}{4} = 12.75$ <p>Get the children to complete some calculations and record their answers. Collect responses and correct any errors.</p> <div><p>Q How can they use the inverse to check the calculation on the calculator?</p></div> <ul style="list-style-type: none">Write on the board: $133 \div 5$ $57 \div 4$ <p>and with the class work through these on calculators.</p> <p>Check using the inverse operation. Set class others to do. Collect responses and correct any errors.</p>	<ul style="list-style-type: none">Using an OHP calculator ask the children for a calculation that will give a whole number and remainder equivalent to 0.5. <div><p>Q What other ways can we express 0.5?</p></div> <ul style="list-style-type: none">Repeat this for 0.2, 0.3 etc. <p>HOMEWORK – Give the answers 15.6, 24.4 and 4.75. Ask children to think of a division question for each.</p> <div><p>By the end of the lesson children should be able to:</p><ul style="list-style-type: none">Express a quotient as a fraction or decimal when dividing whole numbers within the range of <u>near known facts</u>;Key in and interpret the outcome of calculations using a calculator.<p>(Refer to supplement of examples, section 6, pages 57 and 73.)</p></div>
	$\frac{1}{2}$	70%	40%	0.3	0.2	$\frac{1}{10}$																												
0.25	$\frac{1}{5}$	0.8	$\frac{1}{4}$	$\frac{3}{4}$	0.6																													
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RESOURCES Whiteboards Resource sheet 2.3																																		

[illegible]

Planning sheet	Day Five	Unit 2 <i>Multiplication and division 1</i>	Term: <i>Spring</i>	Year Group: 6
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities / Focus Questions
Round decimals to the nearest whole number or tenth.	<ul style="list-style-type: none"> Quickly call out numbers with 1 or 2 decimal places for children to round to the nearest whole number. Ask children to select and record five numbers, with one decimal place, in the range 2 to 4 e.g. 3.7. Call out numbers with two decimal places for children to round to one decimal place and compare with their five numbers. The first to have crossed out their five numbers wins the game. Keep a record of the numbers to check answers. Repeat using different ranges and mix of roundings. 	<p>Dividing £.p by a two-digit number to give £ and p.</p> <p>Round up and down after division on context.</p> <p>Use a calculator effectively.</p> <p>RESOURCES OHP calculator Calculators</p>	<ul style="list-style-type: none"> Give the children this problem: <div>Q It cost 17 people £89.25 to go to the cinema. How much did it cost each person?</div> <p>Discuss ways to solve this problem. Calculate it on the OHP calculator and get the children to work it out on their calculator. Make sure children can interpret the calculator display correctly.</p> Give other problems, e.g.: <div>Q Train fares cost £14.50. I have £52. How many people can I take on the journey?</div> <p>Children to discuss in pairs, and use calculators to solve the problem.</p> Ask children to estimate the answer using $3 \times £15 = £45$. Show them how to record the calculation $£52 \div £14.50$ and remind them that this is what they would record on their test paper in the 'Explain your method' box to secure a mark. Emphasise the context of the problem, in this case people on a journey, so there can be no parts and they must round down. Give other problems that require rounding up or down. Write on board: Entrance to park is Adults: £2.60, Children: £1.25 <div>Q For £50, how many children could 3 adults take to the park?</div> <p>Discuss problem and estimate. Ask what calculations they should record. Emphasise the importance of jottings on problems that require two or more stages.</p> Give children problems to solve in pairs. Collect answers and discuss methods. Correct any mistakes. 	<ul style="list-style-type: none"> Read out some simple money problems. Children have to decide whether to round up or round down by thumbs up and thumbs down. Problems like: <div>Q I have £25. How many books costing £4 each can I buy?</div> <div>Q Dave has £32. Socks cost £6.99 for 3 pairs, how many can he buy?</div> <p>By the end of the lesson the children should be able to:</p> <ul style="list-style-type: none"> Decide what to do after division and round up or down accordingly; Make sensible decisions about rounding down or up after division. <p>(Refer to supplement of examples, section 6, page 57.)</p>

3060	7.9	101	42	1400
0.79	1010	30.6	14	28
4.2	0.14	10.1	79	420
306	7900	0.042	0.101	0.306

‘Follow me’ cards – oral/mental

40	6×5	30	9×7	63	8×4
32	7×8	56	6×3	18	9×4
36	1×5	5	9×5	45	7×7
49	7×4	28	9×3	27	8×6
48	6×4	24	7×3	21	9×6
54	8×2	16	9×0	0	2×7
14	7×10	70	6×2	12	7×1
7	10×9	90	9×9	81	4×5
20	5×3	15	6×7	42	10×10
100	5×5	25	10×3	30	5×8

$1\frac{1}{2}$	70%	40%	0.3	0.2	$1\frac{1}{10}$
0.25	$1\frac{1}{5}$	0.8	$1\frac{1}{4}$	$3\frac{3}{4}$	0.6
20%	0.7	30%	$3\frac{3}{5}$	25%	0.5
$3\frac{3}{10}$	75%	50%	80%	0.4	60%
0.1	$4\frac{4}{5}$	$7\frac{7}{10}$	10%	0.75	$2\frac{2}{5}$

Related Key Stage 2 National Test Questions:

2000 Test A

23

Leila knows that

$65 \times 3 = 195$

Explain how she can **use this information** to find the answer to this multiplication:

165×3



.....

.....

.....

23

1 mark

2000 Test B

17

Put a tick (✓) in the correct box for each calculation.

Use a calculator.

The first one has been done for you.



	less than 1000	equal to 1000	more than 1000
$8.9 \times 9.9 \times 11.9$			✓
$(786 - 387) \div 0.41$			
$95.4 + (91 \times 9.95)$			
$12.5 \times (21.1 + 58.9)$			

17

2 marks

Total



This is the cost to visit the waxworks.

Adults	£8.50
Children	£4.50

On Friday morning **12 adults** and **20 children** visit the waxworks.

How much do they pay altogether?



Show
your **method**.
You may get
a mark.

£

Guide books cost **£1.50** each.

The waxworks sells **£24** worth of **guide books**.

How many guide books is this?



10a

2 marks

10b

1 mark

Total

Unit 2 Year 6 (Spring Term)

2001 Test B

21

Write in the **missing** number.



$$404.09 \div \boxed{} = 8.5$$

21

1 mark

2002 Test A

2

Write in the **missing** numbers.



$$5 \times 70 = \boxed{}$$

2a

1 mark

$$4 \times \boxed{} = 200$$

2b

1 mark

2002 Test A

7

Circle all the **multiples of 8** in this list of numbers.



18 32 56 68 72

7

1 mark

2002 Mental Arithmetic

3

Multiply eight by seven.

4

What is the square root of sixty-four?

5

What is twenty-five multiplied by two hundred?

Total

2002 Test B

1

Draw a line from each card to the correct part of the number line.

One has been done for you.

You may use a calculator.

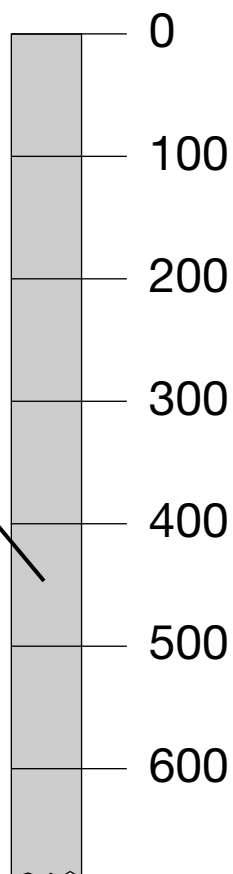


$$283 + 159$$

$$29 \times 18$$

$$720 \div 45$$

$$759 - 484$$



21

1 mark

21

1 mark

21

1 mark

Total