

Y7	UNIT 8 <i>Division of Decimals</i>	Lesson Plan 1	<i>Division of Whole Numbers</i>
<b>Activity</b>  1	<b>Revision</b> T: We're going to look at division in this lesson, but we'll start with some quick multiplications of whole numbers to get warmed up. <b>M 8.1</b> and similar quick-fire questions.  T: Right, now let's go on to division. <b>PB 8.1, Q1</b>  T: What is the relationship between multiplication and division? <i>(Division is multiplication in reverse)</i> T: In what other way can we think of $72 \div 8$ ? <i>(<math>72 \div 8 = 9</math> since <math>9 \times 8 = 72</math>)</i> T: That's right. Is everybody happy with that? Let's look at another division: $54 \div 6$ (to a struggling P). P: $54 \div 6 = 9$ since $9 \times 6 = 54$ , and so on  <div>7 mins</div>	<b>Notes</b>  Mental work; whole class activity. T makes Ps concentrate by working at a fast tempo T asks, points to P, P answers.  There should be no problems with these simple divisions, but if some Ps struggle, pace will have to be slowed and work repeated. Praising.  T may help. Praising.	
2	<b>BODMAS</b> T: We know we can add, subtract, multiply and divide. But what do we do if we have more than one of these in the same example? How should we calculate $3 - 5 \div (1 + 4)$ ? T: Do you remember BODMAS? T: OK: I see some of you can remember. Write it in your Ex.Bs and make sure you know it. T: Let's put BODMAS into practice: <div><div><div>(a) <math>21 + 14 \div 7 =</math></div><div>(b) <math>(21 + 14) \div 7 =</math></div><div>(c) <math>3 \times (5 - 2) =</math></div><div>(d) <math>3 \times 5 - 2 =</math></div><div>(e) <math>3 - 5 \div (1 + 4) =</math></div></div><div><div><math>(21 + 2 = 23)</math></div><div><math>(35 \div 7 = 5)</math></div><div><math>(3 \times 3 = 9)</math></div><div><math>(15 - 2 = 13)</math></div><div><math>(3 - 5 \div 5 = 3 - 1 = 2)</math></div></div></div> <b>OS 8.1</b>  P: For C, we have to do the multiplication before the addition, giving $8 + 2 \times 4 = 8 + 8 = 16$ , so the statement is false. If we put in a pair of brackets, it can be true, since $(8 + 2) \times 4 = 10 \times 4 = 40$ . T: Whose answer was the same as this? Did anyone have a different answer? Is it correct? etc. Write the correct calculations in your Ex.Bs.  <div>23 mins</div>	  Some Ps will volunteer to answer, others not sure. Ps discuss and give suggestions, arriving at BODMAS.  T goes through BODMAS procedures (see PB 8.1).  Whole class activity. T writes tasks on BB. Ps volunteer, T points, P gives explanation and answer. Agreement (or not). T writes answers on BB, Ps in Ex.Bs. Praising.  Individual work, monitored, helped. Statements appear on OHP. Ps work in Ex.Bs. After some minutes when most Ps have finished, T stops Ps. A P is called to write answer on OS, saying it aloud, explaining, and inserting brackets where their use makes the statement true. Agreement, feedback. Praising. Another P then does the next question, etc.	

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Activity 3	<p><b>Dividing larger numbers</b></p> <p>T: So far we have divided small numbers by smaller ones, but we need to be able to divide larger numbers as well. For example:</p> $3823 \div 7$ <p>Who can show us how to do this?</p> <p>P (at BB): <math>3823 \div 7 = \dots</math></p> <p>T: Let's see another one.</p> <p>P (struggling): <math>954 \div 6 = \dots</math></p> <p>T: And how about this one:</p> $3840 \div 15 = \dots ?$ <p>T: Now you can try some on your own.</p> <p>PB 8.2, Q2 (a), (b), (d), (g), (j)</p> <p style="text-align: right;">35 mins</p>	Notes
(continued)	<p><b>4 Applications</b></p> <p>T: Now let's look at an example of this being used in everyday life.</p> <p><b>Activity 8.3</b></p> <p>T: Read through the information as far as question 1.</p> <p>e.g.</p> <p>T: What is an ISBN?</p> <p>What four parts make up an ISBN?</p> <p>How is the check digit calculated?</p> <p>Did everyone understand how the check digit of 8 was calculated?</p> <p>T: Look at question 1(a). Who would like to explain how we do this?</p> <p>Now you can each write the calculation in your Ex.Bs; we'll see who can get the correct answer first.</p> <p>P (at BB): Writes and explains to class the calculation used:</p> $1 \times 10 + (8 \times 9 + 6 \times 8 + 9 \times 7 + 9 \times 6 + 3 \times 5 + 1 \times 4) + (0 \times 3 + 0 \times 2) = 266$ $266 \div 11 = 24, r 2, \text{ so the check digit is } 9, \text{ because } (266 + 9) \text{ is divisible by } 11 \text{ with no remainder.}$ <p>T: Who worked out the correct answer on their own?</p> <p>Were there any different answers?</p> <p>Which solution is correct?</p> <p>What were the mistakes?</p> <p>T: Let's look at question 1(b). We'll ask the person who was fastest with the question 1 (a) to work it out and explain it at the BB.</p> $1 \times 10 + (8 \times 9 + 6 \times 8 + 9 \times 7 + 9 \times 6 + 3 \times 5 + 1 \times 4) + (0 \times 3 + 1 \times 2) = \dots$	<p>Ps volunteer, T points, P comes to BB, writes and explains loudly. Agreement. Praising.</p> <p>Now T points to a struggling P to come to BB (encouraging slower Ps to work in front of class). T may help. Praising.</p> <p>Probably better to choose a stronger P for this. Larger divider may be problem for weaker Ps. Be patient!</p> <p>Individual work, monitored, helped. Checking at BB.</p> <p>Agreement, feedback, self-correction. Praising.</p> <p>T gives each P a copy of Activity 8.3. Ps read the text and then T asks questions to check that they have understood it.</p> <p>Ps volunteer, T points, P answers (looking at text if necessary).</p> <p>A volunteer P explains how to proceed. Agreement. Praising.</p> <p>Ps work in Ex.Bs, indicating to T when they have finished. T notes who is first and looks at their work to check accuracy. When most have finished fastest P writes solution on BB.</p> <p>Results compared and discussed.</p> <p>Agreement, feedback, self-correction. Praising.</p> <p>P who was fastest with question 1(a) comes to BB. P explains the process, writing it out as well if preferred.</p>



<b>Y7</b>	<b>UNIT 8</b> <i>Division of Decimals</i> Lesson Plan 2	<i>Division of Decimals</i>
<b>Activity</b>  <b>1</b>	<b>Checking homework</b> <b>PB 8.1, Q3, (a), (d), (g), (j)</b> (a) 35 (d) 11 (g) 8 (j) 8 <b>PB 8.1, Q4 (a), (i)</b> (a) 125 (i) 16 <b>PB 8.2, Q2 (e), (k)</b> (e) 1234 (k) 238 <b>Activity 8.3, Q1 (d)</b> 3  <b>Activity 8.3, Q2 (for stronger Ps)</b> Possible answers: <div style="text-align: right;">0 7 1 3 5① 2 7 2 5</div> <div style="text-align: right;">or 0 7 1 3⑥ 2 2 7 2 5</div> <div style="text-align: right;">5 mins</div>	<b>Notes</b>  T has already asked one of Ps to write solutions on BB as soon as P arrives. Checking, discussion; whole class activity. Did you get the correct answer to the first one? Where did you make a mistake? etc. Agreement, feedback, self-correction. Praising. T asks who tried to solve this question while P is writing previous answers on BB. T checks in Ex.Bs of those who attempted this. Praising.
<b>2</b>	<b>Practising mental division of decimals</b> Today we'll recap on division of decimals. Let's start with some mental work using the powers of 10.  <div style="display: flex; flex-wrap: wrap;"> <div style="width: 33%;">5 × 10</div> <div style="width: 33%;">50 × 10</div> <div style="width: 33%;">500 × 10</div> <div style="width: 33%;">500 × 100</div> <div style="width: 33%;">23 × 100</div> <div style="width: 33%;">23 × 1000</div> <div style="width: 33%;">40 × 100</div> <div style="width: 33%;">40 × 1000</div> <div style="width: 33%;">2.5 × 100</div> <div style="width: 33%;">480 ÷ 10</div> <div style="width: 33%;">1600 ÷ 10</div> <div style="width: 33%;">1600 ÷ 100</div> <div style="width: 33%;">32 ÷ 100</div> <div style="width: 33%;">3780 ÷ 1000</div> <div style="width: 33%;">0.4 ÷ 10</div> <div style="width: 33%;">4.05 ÷ 100</div> <div style="width: 33%;">53.2 ÷ 10</div> <div style="width: 33%;">4.7 ÷ 100</div> </div> <div style="text-align: right;">13 mins</div>	Mental work, question by question, to warm up; everyone contributing. Ps are asked to state in words how to multiply by powers of 10: <i>when we multiply by a number, 10, 100, 1000, each digit of the number takes a higher place in the place value table, and the missing digits are replaced with zeros</i> and how to divide by powers of 10: <i>when we divide a number by 10, 100, 1000, each digit moves 1, 2, 3 steps to the right, to a lower place in the place value table.</i> When necessary, Ps can write the question in Ex.Bs to help them see what to do. Agreement. Praising.
<b>3</b>  <b>3A</b>	<b>Dividing decimals by whole numbers</b> <b>PB 8.2, Q3 (a), (e)</b> P (at BB): $2.54 \div 2 = \dots$ , etc.  T: So what do you have to take care with here?  T: Who would like to try question 3 (e)?  Now we'll look at another problem: <b>PB 8.2, Q4 (c)</b>	Whole class activity. Volunteer comes to BB to write the answer, explaining clearly to other Ps how to divide decimals. Agreement. Feedback. Praising. Then T makes a slower P repeat the rule for the positioning of the decimal point. For this, T chooses a slower P, maybe not a volunteer, and helps P to understand and give answer. For Q4 (c) a stronger P is called to BB to explain how to continue the division rather than just state the remainder.



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<b>Activity</b>  <b>5</b> <i>(continued)</i>	<p>T: What is the result this time? (22)</p> <p>This is the only magic I can do! I can't take rabbits out of hats or change paper into five pound notes!</p> <p>If anyone can work out at home, using the letters <i>a</i>, <i>b</i> and <i>c</i>, why this maths magic works, I'll give them a good mark at the next lesson, and they will be on their way to becoming a magician!</p> <p style="text-align: right;">_____ 45 mins _____</p>	<b>Notes</b>  Ps answer in chorus.  Extra homework for stronger Ps.
	<p><b>Set homework</b></p> <p><b>PB 8.2, Q1 (b), (d), (f), (i)</b></p> <p><b>PB 8.2, Q3 (b), (f), (h)</b></p> <p><b>PB 8.2, Q4 (a), (e)</b></p>	

Y7	UNIT 8 <i>Division of Decimals</i>	Lesson Plan 3	<i>Problems in Context</i>
Activity		Notes	
1	<p><b>Checking homework</b></p> <p><b>PB 8.2, Q1 (b), (d), (f), (i)</b> (b) 420 (d) 371.4 (f) 60 (i) 7.5</p> <p><b>PB 8.2, Q3 (b), (f), (h)</b> (b) 7.21 (f) 12.31 (h) 10.32</p> <p><b>PB 8.2, Q4 (a), (e)</b> (a) 5.25 (e) 10.5</p> <p style="text-align: right;">5 mins</p>	<p>A P writes the answers only on BB. Agreement or not. Feedback, self-correction. Praising.</p>	
2	<p><b>Mental work</b></p> <p>T: First, let's see how fast you can count with small numbers.</p> <div><p>1(a) <math>4 + 6 \div 2 =</math> (7)</p><p>2(a) <math>(4 + 6) \div 2 =</math> (5)</p><p>3(a) <math>4 \div 2 + 6 \div 2 =</math> (5)</p><p>1(b) <math>4 \times (5 + 3) =</math> (32)</p><p>2(b) <math>4 \times 5 + 3 =</math> (23)</p><p>3(b) <math>4 \times 5 + 4 \times 3 =</math> (32)</p><p>1(c) <math>7 - 2 \times 3 =</math> (1)</p><p>2(c) <math>(7 - 2) \times 3 =</math> (15)</p><p>3(c) <math>7 \times 3 - 2 \times 3 =</math> (15)</p><p>1(d) <math>12 \div 4 + 2 =</math> (5)</p><p>2(d) <math>12 \div (4 + 2) =</math> (2)</p><p>3(d) <math>12 \div 4 + 12 \div 2 =</math> (9)</p></div> <p>T: What do you notice about all the (a), (b), (c) questions? (In each of them there are two equal numbers)</p> <p>T: Can you make them into true statements?</p> <p style="text-align: center;"><math>(4 + 6) \div 2 = 4 \div 2 + 6 \div 2</math> <math>4 \times (5 + 3) = 4 \times 5 + 4 \times 3</math> <math>(7 - 2) \times 3 = 7 \times 3 - 2 \times 3</math></p> <p>T: Write them in your Ex.Bs and note the experiences. What would be the fourth statement if it were true? ( <math>2(d) = 3(d)</math> )</p> <p>T: It's very important, too, that it's false. So write this in your Ex.Bs and learn it as well:</p> <p style="text-align: center;"><math>12 \div (4 + 2) \neq 12 \div 4 + 12 \div 2</math></p> <p style="text-align: right;">13 mins</p>	<p>Mental work: tasks appear on OHP. Ps calculate in their heads, volunteer and T points to P to explain how they have done the calculation. Agreement. Praising. T write answers on the OS.</p> <p>Ps dictate, T writes on BB Discussion of the experiences.</p> <p>T writes on BB, Ps in Ex.Bs.</p>	
3	<p><b>Problems in context</b></p> <p>Today we're going to deal with some problems in context which we can solve using our knowledge of division. The slide shows four different examples of the same calculation.</p> <p><b>OS 8.4</b></p> <p>P (Problem A): <math>100 \div 16 = 6, r 4</math> 7 minibuses are needed. 6 of them will be full and 4 people can travel on the 7th bus.</p> <p>(continued)</p>	<p>Ps work in four groups. T cuts some OS 8.4 sheets into sections with one problem on each. Each group is given one problem. Ps work in their groups, discussing the problem. T must ensure that Ps give the answer as a whole sentence as well as in writing.</p>	

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<b>Activity</b>  <b>3</b> <i>(continued)</i>	<p>P (Problem B): <math>100 \div 16 = 6, r 4</math>  We can buy 6 textbooks; there isn't enough money for the seventh.</p> <p>P (Problem C): <math>100.00 \div 16 = 6.25</math>  Each person gets £6.25.</p> <p>P (Problem D): <math>100 \div 16 = 6, r 4</math>  There will be 4 sweets left over.</p>	<p><b>Notes</b></p> <p>When groups are ready, a spokesperson from each comes to the front, tells the class the problem their group had to solve and gives the answer as a complete sentence, also writing the calculation on BB.</p> <p>Finally, T and Ps conclude that it is important to understand the question, because the same calculation may give different answers depending on the context in which it is set.</p>
<b>4</b>	<p><b>Another problem in context</b>  <b>PB 8.3, Q2</b></p>	<p>T points to P to read the question clearly. Ps try to interpret the problem together. They might draw it on BB.</p> <p>Agreement. Praising.</p> <p>T stresses that each problem in context has to be answered by a whole sentence.</p>
<b>5</b>	<p><b>PB 8.3, Q 17.</b></p> <p>P: <math>£5 = 500 \text{ p}</math>,  and <math>500 \div 85 = 5, r 75</math></p> <p>T: The divider and the remainder are quite large numbers. Would anyone choose another method to get the answers?</p> <p>P (or T): Let's do the calculation in pounds.</p> <p>P: With each pound John can buy one cassette tape and have 15p left over. The five remainders total 75 pence, and that is not enough for another tape. Therefore:</p> <p>(a) he can but 5 tapes,  and  (b) he will have 75p change.</p>	<p>Whole class activity.</p> <p>One P reads the question. Ps together decide which operation must be used and how to get the answers. Then T points to a P, who writes the solutions on BB, with explanations.</p> <p>T may help Ps find the method.</p>
<b>6</b>	<p><b>Further practice, individually</b>  <b>PB 8.3 (any other questions)</b></p>	<p>Individual work. Ps reads the question in PB and work in Ex.Bs. T monitors, helps.</p> <p>After some minutes T stops the work and calls a slower P, who T has noticed has the correct calculation, to BB.</p> <p>P explains and writes on BB.</p> <p>Agreement, feedback, self-correction. Praising.</p>



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<b>Activity</b> <b>7</b>	<p><b>Mental work</b></p> <p>M 8.3 with     Q6 Calculate:    <math>8 - 4 \div 2</math>  <math>3 \times (5 + 2)</math></p> <p>T: Can anyone suggest a quick way to do Q4?</p> <p>P (maybe with T's help): With each pound we can buy 2 batteries, so from £8 we can buy 16 batteries and still have 50p left. This will buy another one, so the answer is 17 batteries.</p> <p>T (for Q6): Can anyone say what key word will help us here?</p> <p>P: BODMAS (says what it means).</p> <p style="text-align: right;">_____ 45 mins _____</p>	<p style="text-align: center;"><b>Notes</b></p> <p>Mental work. Task appears on OHP. T reads out questions (Ps also looking at OHP), points to P to answer.</p> <p>Agreement. Praising.</p> <p>From Q 4, T may let Ps write the questions in Ex.Bs, and also answer extra questions involving remainders.</p> <p>Praising.</p>
<b>8</b>	<p><b>Set homework</b></p> <p>Of course, you need to be able to divide bigger whole numbers and decimals in context, so tonight's homework will be a bit longer than usual to give you some practice.</p> <p><b>PB 8.1, Q3 (e), (f), (h)</b></p> <p><b>PB 8.2, Q1 (a), (g), (h), (j)</b></p> <p><b>PB 8.2, Q3, (c), (g)</b></p> <p><b>PB 8.2, Q4 (b), (d)</b></p> <p><b>PB 8.3, Q3, 10 and 16</b></p>	