

Y8	UNIT 4 <i>Rounding and Estimating</i> Lesson Plan 1	<i>Revision: Whole Numbers and Decimals</i>
Activity		Notes
1	<p>Introduction</p> <p>T: At the beginning of the term we looked back at how to deal with whole numbers and decimals. In this unit we're going to revise just about all the basic arithmetic you have learnt.</p> <p>T: Let's start with some mental work.</p> <p>PB 4.1, Q1 ((a) 29 (b) 46 (c) 79 (d) 174 (e) 349 (f) 557)</p> <p>PB 4.1, Q3 ((a) 12 (b) 44 (c) 51 (d) 15 (e) 219 (f) 551)</p> <p>extended with questions:</p> $5 - 8 = (-3) \quad 21 - 37 = (-16) \quad 38 - 61 = (-23)$ <p>PB 4.2, Q1 (a) - (c) ((a) 7.7 (b) 48.7 (c) 5.3)</p> <p>PB 4.2, Q2 (a) - (c) ((a) 4.3 (b) 14.2 (c) 2.4)</p> <p>extended with questions:</p> $0.5 - 0.9 = (-0.4) \quad 1.7 - 3.8 = (-2.1)$ <p style="text-align: right;">8 mins</p>	<p>A whole lesson of revision; mental work or writing on BB and in Ex.Bs, with plenty of discussion and with no individual work.</p> <p>Mental warm-up activity with all Ps contributing. T asks Ps question by question, encouraging slower Ps.</p> <p>Agreement. Praising.</p>
2	<p>Addition and subtraction</p> <p>Now you've warmed up, let's work with some less straightforward numbers.</p> <p>PB 4.1, Q2 (f) (1112)</p> <p>PB 4.1, Q4 (d), (f) ((d) 188 (f) 3452)</p> <p>PB 4.2, Q1 (e) (19.02)</p> <p>PB 4.2, Q2 (e), (f) ((e) 6.28 (f) 2.03)</p> <p>P₄: $\begin{array}{r} 18.6 \\ + 0.42 \\ \hline 19.02 \end{array}$</p> <p>We have to make sure that the same place values are in the same column, with decimal points also lining up in the answer.</p> <p>P₆: $\begin{array}{r} 8.3 \\ - 6.27 \\ \hline \end{array}$ we can write: $\begin{array}{r} 8.30 \\ - 6.27 \\ \hline 2.03 \end{array}$</p> <p style="text-align: right;">14 mins</p>	<p>Whole class activity.</p> <p>T calls volunteer/encouraged slower Ps to come to front to give solutions and explain if necessary.</p> <p>Other Ps write in Ex.Bs, stronger ones can do the calculations in their heads and write down only the answers.</p> <p>T also asks Ps, here and throughout the lesson, to draw up the rules they've learnt (in this instance, for addition and subtraction of decimals).</p> <p>T monitors discussion, ensures orderly, precisely spoken mathematics; agrees and praises.</p>
3	<p>Multiplication and division</p> <p>T: Let's look at multiplication and division by whole numbers.</p> <p>PB 4.1, Q5 ((a) 36 (b) 55 (c) 46) ((d) 93 (e) 88 (f) 606)</p> <p>PB 4.1, Q8 (a) - (c) ((a) 34 (b) 16 (c) 41)</p> <p>PB 4.2, Q3 (a), (b) ((a) 8.6 (b) 14)</p> <p>PB 4.2, Q4 (a) ((a) 3.4)</p> <p style="text-align: right;">20 mins</p>	<p>Mental work, but slower Ps can use Ex.Bs if helpful. If necessary, T can put some questions (multiplication and division) from multiplication tables up to 10×10 for the weakest, before starting on PB 4.1, Q5.</p> <p>Praising.</p>

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4A <i>(continued)</i>	<p>Multiplying and dividing by powers of 10</p> <p>T: I expect you can remember how to multiply and divide with larger numbers.</p> <table><tr><td>8×10</td><td><i>(80)</i></td><td>8×100</td><td><i>(800)</i></td></tr><tr><td>8×1000</td><td><i>(8000)</i></td><td>80×10</td><td><i>(800)</i></td></tr><tr><td>63×10</td><td><i>(630)</i></td><td>63×100</td><td><i>(6300)</i></td></tr><tr><td>630×100</td><td><i>(63\ 000)</i></td><td>3×20</td><td><i>(60)</i></td></tr><tr><td>3×200</td><td><i>(600)</i></td><td>37×2000</td><td><i>(74\ 000)</i></td></tr></table> <p>P: When multiplying by powers of 10, each digit is moved 1, 2, 3, ... places to the left to take a higher value, and the missing digits are replaced with zeros.</p> <table><tr><td>$6000 \div 10$</td><td><i>(600)</i></td><td>$60\ 000 \div 100$</td><td><i>(600)</i></td></tr><tr><td>$6000 \div 1000$</td><td><i>(6)</i></td><td>$4600 \div 100$</td><td><i>(46)</i></td></tr><tr><td>$800 \div 20$</td><td><i>(40)</i></td><td>$1200 \div 200$</td><td><i>(6)</i></td></tr></table> <p>P: When dividing by powers of 10, each digit is moved 1, 2, 3, ... places to the right to take a lower value.</p>	8×10	<i>(80)</i>	8×100	<i>(800)</i>	8×1000	<i>(8000)</i>	80×10	<i>(800)</i>	63×10	<i>(630)</i>	63×100	<i>(6300)</i>	630×100	<i>(63\ 000)</i>	3×20	<i>(60)</i>	3×200	<i>(600)</i>	37×2000	<i>(74\ 000)</i>	$6000 \div 10$	<i>(600)</i>	$60\ 000 \div 100$	<i>(600)</i>	$6000 \div 1000$	<i>(6)</i>	$4600 \div 100$	<i>(46)</i>	$800 \div 20$	<i>(40)</i>	$1200 \div 200$	<i>(6)</i>	Mental work. Asking, agreeing, praising, question-by-question.
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4B	<p>Practice multiplying and dividing by powers of 10 - spoken</p> <p>T: <div>There is something unusual about the natives of Planet X. The number of their teeth increases proportionally with their age. For example, if an X-ian has 4 teeth at the age of 1, they will have 8 teeth at the age of 2, 12 teeth at the age of 3, and so on.</div></p> <p>How many teeth will an X-ian have at the age of:</p> <table><tr><td>T: 10</td><td>Ps: 40</td></tr><tr><td>100</td><td>400</td></tr><tr><td>1000</td><td>4000</td></tr></table> <p>T: Fine! Another X-ian is 100 years old now, and has 1400 teeth. How many teeth did he have at the age of:</p> <table><tr><td>10</td><td>Ps: 140</td></tr><tr><td>1</td><td>14</td></tr></table> <p>T: Well done! Let's look at another example. This X-ian was especially unusual - she had only 0.06 teeth at the age of 1. How many teeth will she have at the age of:</p> <table><tr><td>T: 10</td><td>Ps: 0.6</td></tr><tr><td>100</td><td>6</td></tr><tr><td>1000</td><td>60</td></tr></table>	T: 10	Ps: 40	100	400	1000	4000	10	Ps: 140	1	14	T: 10	Ps: 0.6	100	6	1000	60	Light-hearted example using calculations in context (!).																
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4C	<p>Practice multiplying and dividing by powers of ten - written</p> <p>T: Now write these calculations in your Ex.Bs and write down the solutions.</p> <table><tr><td>730×100</td><td><i>(73\ 000)</i></td><td>0.7×100</td><td><i>(70)</i></td></tr><tr><td>3.4×1000</td><td><i>(3400)</i></td><td>$9 \div 10$</td><td><i>(0.9)</i></td></tr><tr><td>$5.4 \div 10$</td><td><i>(0.54)</i></td><td>$71 \div 1000$</td><td><i>(0.071)</i></td></tr><tr><td>$780 \div 100$</td><td><i>(7.8)</i></td><td>$475.2 \div 100$</td><td><i>(4.752)</i></td></tr></table>	730×100	<i>(73\ 000)</i>	0.7×100	<i>(70)</i>	3.4×1000	<i>(3400)</i>	$9 \div 10$	<i>(0.9)</i>	$5.4 \div 10$	<i>(0.54)</i>	$71 \div 1000$	<i>(0.071)</i>	$780 \div 100$	<i>(7.8)</i>	$475.2 \div 100$	<i>(4.752)</i>	T writes tasks on BB, Ps volunteer, answer, T agrees (or not), writes correct answers on BB, Ps write in Ex.Bs.																
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32 mins																																		

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5A	<p>Revision: long multiplication with whole numbers</p> <p>T: We've met many methods of multiplying numbers. The most important of them is long multiplication. Who'd like to show us how to do it?</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> $P_1: 34 \times 26$ $\begin{array}{r} 34 \\ \times 26 \\ \hline 680 \\ 204 \\ \hline 884 \end{array}$ </div> <div style="text-align: center;"> $P_2: 34 \times 260$ $\begin{array}{r} 260 \\ \times 34 \\ \hline 7800 \\ 1040 \\ \hline 8840 \end{array}$ </div> <div style="text-align: center;"> $P_3: 34 \times 206$ $\begin{array}{r} 206 \\ \times 34 \\ \hline 6180 \\ 824 \\ \hline 7004 \end{array}$ </div> </div>	<p>T chooses 3 volunteer Ps to do the multiplications at BB at the same time, and asks the other Ps to observe the role of the zero. (The other Ps can also help the three volunteers.) Write in Ex.Bs. Praising.</p>
5B	<p>Revision: long multiplication with decimals</p> <p>T: And what about decimals?</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> $P_1: 52 \times 6.5$ $\begin{array}{r} 65 \\ \times 52 \\ \hline 3250 \\ 130 \\ \hline 3380 \end{array}$ $52 \times 6.5 = 338$ </div> <div style="text-align: center;"> $P_2: 5.2 \times 6.5$ $\begin{array}{r} 65 \\ \times 52 \\ \hline 3250 \\ 130 \\ \hline 3380 \end{array}$ $5.2 \times 6.5 = 33.8$ </div> <div style="text-align: center;"> $P_3: 5.2 \times 0.065$ $\begin{array}{r} 65 \\ \times 52 \\ \hline 3250 \\ 130 \\ \hline 3380 \end{array}$ $5.2 \times 0.065 = 0.338$ </div> </div> <p>P_4: We count off as many decimal places in the product as there were in total in the factors.</p>	<p>Another three volunteers come to show how to work with decimals. Other Ps agree/ correct, write in Ex.Bs.</p> <p>One of the volunteers is asked to draw up the rule. Praising.</p>
6	<p>Division</p> <div style="display: flex;"> <div style="flex: 1;"> <p>(1) PB 4.1, Q8 (f)</p> <p>(2) PB 4.2, Q4 (c)</p> <p>(3) 198 ÷ 12</p> <p>(4) PB 4.2, Q7 (f)</p> </div> <div style="border: 1px solid black; padding: 10px; flex: 1;"> $1407 \div 7 = 201$ $52.4 \div 4 = 13.1$ $198 \div 12 = 16.5$ $0.84 \div 0.4 = 8.4 \div 4 = 2.1$ </div> </div>	<p>Whole class activity. T writes tasks on BB, Ps volunteer. In turn, at BB,</p> <ul style="list-style-type: none"> - <i>first</i> P explains the process of dividing (with or without remainder). - <i>second</i> P shows how to divide decimals. - <i>third</i> P explains how to continue the division of a whole number, rather than just state the remainder. - <i>fourth</i> P explains dividing by decimals. <p>Other Ps listen attentively and write in Ex.Bs. T agrees. Praises.</p>
	<p>Set homework</p> <p>PB 4.1, Q10 (b) - (e)</p> <p>PB 4.1, Q9 (f)</p> <p>PB 4.2, Q1 (f)</p> <p>PB 4.2, Q8 (a) - (f)</p>	<p>T asks Ps to review the topic covered in this lesson before starting homework, to check that they understand the processes. They should check their answers with a calculator to find their mistakes, and work out why they have made them.</p>

Y8	UNIT 4 <i>Rounding and Estimating</i> Lesson Plan 2	Revision: Fractions																										
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1	<p>Checking homework</p> <p>PB 4.1, Q10 (b) - (e) (b) 441 (c) 91 (d) 1548 (e) 183</p> <p>PB 4.1, Q9 (f) (f) 15</p> <p>PB 4.2, Q1 (f) (f) 3.752</p> <p>PB 4.2, Q8 (a) - (f) (a) 54 (b) 7.83 (c) 4.34 (d) 0.544 (e) 1.05 (f) 7.437</p> <p>5 mins</p>	<p>T has asked a P to write results on BB when P arrives.</p> <p>Checking, correcting, feedback. If several Ps have had problems with a particular question, T should explain it again by going through a similar example at BB.</p>																										
2	<p>Revision test</p> <table><thead><tr><th>Questions</th><th>Solutions</th></tr></thead><tbody><tr><td>(1) (a) 509 + 67.8</td><td>= 576.8</td></tr><tr><td>(b) 15.1 – 3.74</td><td>= 11.36</td></tr><tr><td>(c) 4.2 – 6.2</td><td>= –2</td></tr><tr><td>(2) (a) 50.1 × 100</td><td>= 5010</td></tr><tr><td>(b) 23.8 ÷ 100</td><td>= 0.238</td></tr><tr><td>(c) 0.0067 × 1000</td><td>= 6.7</td></tr><tr><td>(3) (a) 340 × 260</td><td>= 88400</td></tr><tr><td>(b) 48 × 0.405</td><td>= 19.44</td></tr><tr><td>(c) 3.14 × 1.4</td><td>= 4.396</td></tr><tr><td>(4) (a) 2106 ÷ 6</td><td>= 351</td></tr><tr><td>(b) 122 ÷ 4</td><td>= 30.5</td></tr><tr><td>(c) 3.63 ÷ 1.5</td><td>= 2.42</td></tr></tbody></table> <p>20 mins</p>	Questions	Solutions	(1) (a) 509 + 67.8	= 576.8	(b) 15.1 – 3.74	= 11.36	(c) 4.2 – 6.2	= –2	(2) (a) 50.1 × 100	= 5010	(b) 23.8 ÷ 100	= 0.238	(c) 0.0067 × 1000	= 6.7	(3) (a) 340 × 260	= 88400	(b) 48 × 0.405	= 19.44	(c) 3.14 × 1.4	= 4.396	(4) (a) 2106 ÷ 6	= 351	(b) 122 ÷ 4	= 30.5	(c) 3.63 ÷ 1.5	= 2.42	<p>Individual work.</p> <p>Questions appear on OHP and each P is given a copy. After dealing with all the questions, T checks whether or not Ps understand the processes.</p> <p>For checking, T has prepared an OS showing solutions.</p> <p>Feedback will show where there are still weaknesses. (Struggling Ps will be given extra homework according to how they have done in the test.)</p> <p>Self-correction. Praising.</p>
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3	<p>Addition and subtraction of fractions</p> <p>T: How do you get on with fractions?</p> <p>We've looked at their addition and subtraction in Unit 2, so now I'll write some problems on BB and you can explain the method and give the rule in each case.</p> <table><tbody><tr><td>(a) $\frac{4}{9} + \frac{2}{9}$</td><td>$= \frac{6}{9} = \frac{2}{3}$</td></tr><tr><td colspan="2">(We have to add the numerators and leave the denominator as a common one)</td></tr><tr><td>(b) $1\frac{3}{7} - \frac{4}{7}$</td><td>$= \frac{10}{7} - \frac{4}{7} = \frac{6}{7}$</td></tr><tr><td colspan="2">(First we have to convert the mixed number into its improper form)</td></tr><tr><td>(c) $\frac{3}{5} + \frac{3}{4}$</td><td>$= \frac{12}{20} + \frac{15}{20} = \frac{27}{20} = 1\frac{7}{20}$</td></tr><tr><td colspan="2">(First we have to change both fractions to get a common denominator)</td></tr></tbody></table> <p>(continued)</p>	(a) $\frac{4}{9} + \frac{2}{9}$	$= \frac{6}{9} = \frac{2}{3}$	(We have to add the numerators and leave the denominator as a common one)		(b) $1\frac{3}{7} - \frac{4}{7}$	$= \frac{10}{7} - \frac{4}{7} = \frac{6}{7}$	(First we have to convert the mixed number into its improper form)		(c) $\frac{3}{5} + \frac{3}{4}$	$= \frac{12}{20} + \frac{15}{20} = \frac{27}{20} = 1\frac{7}{20}$	(First we have to change both fractions to get a common denominator)		<p>After checking Ps' knowledge about whole numbers and decimals, T carries out a short review on dealing with fractions. There will be further work on this in Unit 9, but reinforcement at this stage is useful.</p> <p>T writes on BB, points to volunteer P (slower ones should be encouraged), agrees and writes correct solution on BB (P dictates).</p> <p>Ps write in Ex.Bs.</p>														
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Activity	<p>4B</p> <p>(c) $3 \div \frac{5}{2} = 3 \times \frac{2}{5} = \frac{6}{5}$</p> <p>(Dividing by the fraction $\frac{a}{b}$ means multiplying by $\frac{b}{a}$)</p> <p>(d) $\frac{6}{5} \div \frac{8}{3}$</p> <p>wrong $\rightarrow = \frac{2}{5} \div \frac{8}{1} = \frac{2}{5} \times \frac{1}{8} = \frac{2}{40} = \frac{1}{20}$</p> <p>correct $\rightarrow = \frac{6}{5} \times \frac{3}{8} = \frac{3}{5} \times \frac{3}{4} = \frac{9}{20}$</p> <p>(Cancelling just after changing it into a multiplication)</p> <p>_____ 40 mins _____</p>	Notes
5	<p>Individual practice</p> <p><i>Questions</i></p> <div data-bbox="301 965 523 1310" style="border: 1px solid black; padding: 5px;"> <p>(a) $1\frac{1}{4} - \frac{5}{6}$</p> <p>(b) $\frac{3}{7}$ of 4</p> <p>(c) $\frac{6}{5} \div 2$</p> <p>(d) $\frac{4}{9} \div \frac{5}{6}$</p> </div> <p><i>Solutions</i></p> <div data-bbox="654 965 1045 1386" style="border: 1px solid black; padding: 5px;"> <p>$= \frac{5}{4} - \frac{5}{6} = \frac{15}{12} - \frac{10}{12} = \frac{5}{12}$</p> <p>$= \frac{3}{7} \times 4 = \frac{12}{7} = 1\frac{5}{7}$</p> <p>$= \frac{6 \div 2}{5} = \frac{3}{5}$</p> <p>$= \frac{4}{9} \times \frac{6}{5} = \frac{24}{45} = \frac{8}{15}$</p> <p>or $= \frac{4}{9} \times \frac{6}{5} = \frac{4}{3} \times \frac{2}{5} = \frac{8}{15}$</p> </div> <p>_____ 45 mins _____</p>	<p>Individual work, to check whether or not Ps remember the basic points.</p> <p>Tasks, and then solutions, appear on OHP.</p> <p>T monitors, helps, Ps.</p> <p>Checking: feedback, self-correction. Praising.</p>
	<p>Set homework</p> <p>(1) Tasks selected from PB 4.1 and PB 4.2, depending on Ps' mistakes in Revision Test (second Activity in this lesson)</p> <p>(2) Other tasks with fractions:</p> <p>(a) $1\frac{1}{2} + 2\frac{1}{4}$</p> <p>(b) $\frac{4}{7} \div 7$</p> <p>(c) $7 \div \frac{4}{7}$</p> <p>(d) $\frac{3}{10} \times \frac{9}{5}$</p>	

Y8	UNIT 4 <i>Rounding and Estimating</i> Lesson Plan 3	<i>Negative Numbers and Order of Operations</i>
Activity 5	<p>BODMAS</p> <p>T: I've noticed that several of you have been making the same mistake. What do you think it was, and why was it wrong?</p> <p>P: I should have multiplied first, before adding.</p> <p>T: What rule should you have applied?</p> <p>P: BODMAS: brackets first, then division, multiplication, addition and subtraction.</p> <p>T: How could we have got your wrong answer, -2.7 in the last question?</p> <p>P: Using brackets: $(-3 + 2.1) \times 3$</p> <p>T: Find the solutions and explain the order of operations using BODMAS, in the following tasks:</p> <p>(1) PB 4.3, Q1 (b) $8 - 3 \times 2 = 8 - 6 = 2$</p> <p>(d) $3 \times 6 - 9 = 18 - 9 = 9$</p> <p>(2) PB 4.3, Q9 (a) $8.2 \div 0.2 - 0.1 = 41 - 0.1 = 40.9$</p> <p>(c) $8.2 \times (6 - 5.4) = 8.2 \times 0.6 = 4.92$</p> <p>(3) (a) $\frac{(-4) \times (+9)}{-6} = \frac{-36}{-6} = 6$</p> <p>(b) $(-13 + 7) \div (+3) = -6 \div 3 = -2$</p> <p>(4) OS 4.2, Q3 $= 3 + 4 - 24 + 1 = 7 - 25 = -18$</p> <p>OS 4.2, Q4 $= 6 - 11 \times 6 = 6 - 66 = -60$</p> <p style="text-align: right;">40 mins</p>	<p>Notes</p> <p>Whole class activity.</p> <p>T and Ps discuss together the order of operations, and look at its application in some specific tasks.</p> <p>For each question, T writes task on BB, points to P, P gives the first step, with explanation; T then points to another P, P₂ gives the second step and the result.</p> <p>Other Ps correct if necessary, T agrees, praises and writes solution on BB, Ps write it in Ex.Bs.</p>
6	<p>BODMAS: individual practice</p> <p>OS 4.2, Q1 $= 11 \times 3 - 4 = 33 - 4 = 29$</p> <p>OS 4.2, Q2 $= 3 + 21 - 6 = 18$</p> <p>OS 4.2, Q5 $= 14 \div 7 - 6 \times 2 = 2 - 12 = -10$</p> <p style="text-align: right;">45 mins</p>	<p>Individual work, monitored, helped.</p> <p>Detailed checking at BB with explanations as to the order.</p> <p>Agreement, feedback, self-correction. Praising.</p>
	<p>Set homework</p> <p>PB 4.3, Q1 (c), (e), (h), (i)</p> <p>PB 4.3, Q9 (d)</p> <p>PB 4.3, Q4, (a), (c)</p>	

Y8	UNIT 4 <i>Rounding and Estimating</i> Lesson Plan 4	Using Brackets										
Activity		Notes										
1	Checking homework (with more revision)	Verbal checking of Q1 and Q9.										
1A	PB 4.3, Q1 (c) 7 (e) 25 (h) 15 (i) 25 PB 4.3, Q9 (d) 2.06	T points to P, P gives the steps and the answer. Agreement, feedback, self-correction. Praising.										
1B	PB 4.3, Q4 (a), (c) P ₁ : ? × 3 → + 2 → 17 So 17 − 2 = 15 → ? × 3 = 15 → ? = 15 ÷ 3 = 5 P ₂ : ? + 4 → × 2 → 20 So 20 ÷ 2 = 10 → ? + 4 = 10 → ? = 10 − 4 = 6 P ₃ : 3x + 2 = 17 (−2) 3x = 15 (÷3) x = 5 P ₄ : (x + 4) × 2 = 20 (÷2) x + 4 = 10 (−4) x = 6 P ₅ : 3 × 5 + 2 = 17 P ₆ : (6 + 4) × 2 = 20	Detailed checking at BB, recalling both methods Ps have learnt. First, T suggests Ps show solution from using the 'Operation - Inverse Operation' table. For question (a), a volunteer P and for (c) an encouraged, slower P, should be called to BB. Then T asks Ps to explain the other method (balancing equations) they learnt in Y7. Finally, T reminds Ps to check their answer by substituting it into the first equation.										
10 mins												
2	Brackets T: Today we're going to deal with the role of brackets. First, we'll review the rules concerning brackets. OS 4.4 extended with <table><tr><td>(i) 36 ÷ (9 + 3)</td><td>(ix) 36 ÷ 9 − 36 ÷ 3</td></tr><tr><td>(j) 36 ÷ (9 − 3)</td><td>(x) 15 − 6 + 4</td></tr><tr><td>(k) 15 − (6 + 4)</td><td>(xi) 15 + 6 − 4</td></tr><tr><td>(l) 15 − (6 − 4)</td><td>(xii) 36 ÷ 9 + 36 ÷ 3</td></tr><tr><td>(m) 15 + (6 − 4)</td><td>(xiii) 15 − 6 − 4</td></tr></table> e.g.: P: (4 + 2) × 3 = 4 × 3 + 2 × 3, since 6 × 3 = 18 and 12 + 6 = 18 too. This is true, because when multiplying (4 + 2) by 3, we have to multiply both 4 and 2 by 3 ...	(i) 36 ÷ (9 + 3)	(ix) 36 ÷ 9 − 36 ÷ 3	(j) 36 ÷ (9 − 3)	(x) 15 − 6 + 4	(k) 15 − (6 + 4)	(xi) 15 + 6 − 4	(l) 15 − (6 − 4)	(xii) 36 ÷ 9 + 36 ÷ 3	(m) 15 + (6 − 4)	(xiii) 15 − 6 − 4	Whole class activity, and mental work. Tasks appear on OHP. Ps try to review what they remember from Unit 4 and Unit 8 last year. Try to match the pairs ... T points to volunteer P to make a statement, calculate in their head and then clearly say how to match the expressions at OHP, if the statement is true.
(i) 36 ÷ (9 + 3)	(ix) 36 ÷ 9 − 36 ÷ 3											
(j) 36 ÷ (9 − 3)	(x) 15 − 6 + 4											
(k) 15 − (6 + 4)	(xi) 15 + 6 − 4											
(l) 15 − (6 − 4)	(xii) 36 ÷ 9 + 36 ÷ 3											
(m) 15 + (6 − 4)	(xiii) 15 − 6 − 4											

(continued)

Y8	UNIT 4 <i>Rounding and Estimating</i> Lesson Plan 4	<i>Using Brackets</i>
Activity 4 (continued)	<p>T (to a 'true' P): Why do you think it's true?</p> <p>P₃: $4 - 6 = -2$, $-2 \times 2 = -4$</p> <p>T (to a 'false' P): Why do you think the previous answer is wrong?</p> <p>P₄: According to BODMAS, we have to multiply first ..., etc.</p> <p style="text-align: right;">40 mins</p>	Notes T has to calm protesting Ps and suggest that they allow this P to explain the reasoning.
5	<p>Individual work - competition</p> <p>T: Let's see how clever you are. You have four minutes and four 2s to produce as many numbers as you can between 0 and 8. Start now!</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p>Produce all the whole numbers from 1 to 8, using four 2s and the signs $+$, $-$, \times, \div, $()$</p> $\begin{array}{rcl} 2 & 2 & 2 & 2 & = & 0 \\ 2 & 2 & 2 & 2 & = & 1 \\ 2 & 2 & 2 & 2 & = & 2 \\ 2 & 2 & 2 & 2 & = & 3 \\ 2 & 2 & 2 & 2 & = & 4 \\ 2 & 2 & 2 & 2 & = & 5 \\ 2 & 2 & 2 & 2 & = & 6 \\ 2 & 2 & 2 & 2 & = & 7 \\ 2 & 2 & 2 & 2 & = & 8 \end{array}$ </div> <p>A possible solution:</p> $\begin{array}{l} (2 + 2) - (2 + 2) = 0 \\ (2 + 2 - 2) \div 2 = 1 \\ 2 \div 2 + 2 \div 2 = 2 \\ (2 + 2 + 2) \div 2 = 3 \\ 2 + 2 - 2 + 2 = 4 \\ 2 + 2 + (2 \div 2) = 5 \\ 2 \times 2 \times 2 - 2 = 6 \\ \quad \quad \quad ? = 7 \\ 2 \times 2 + 2 \times 2 = 8 \end{array}$ <p style="text-align: right;">45 to 50 mins</p>	<p>Individual work, monitored - competition.</p> <p>Each P has a copy to work on. T gives Ps four minutes. Some Ps will not have finished at the end of the time. (They will probably have difficulty with '7'.)</p> <p>After four minutes, T stops the work, puts a copy of the task as an OS on OHP and asks Ps to complete it.</p> <p>There are many possible solutions (T should listen to all of them) → discussion, agreement, self-correction and praising for each number produced.</p> <p>At the end, T leaves two questions open:</p> <ul style="list-style-type: none"> - how many solutions exist for a number? - is there any solution for the number 7? <p>Feedback. Praising (marking).</p>
	<p>Set homework</p> <p>(1) PB 4.3, Q2 (b), (h) (+ Make it true), Q8, Q10 (a)</p> <p>(2) Give as many solutions as you can for producing the number 4 from four 2s.</p> <p>(3) For stronger Ps: Try to produce the number 7 from four 2s.</p>	

Y8	UNIT 4 <i>Rounding and Estimating</i> Lesson Plan 5	<i>Problems in Context</i>
<p>Activity</p> <p>1</p> <p>1A</p> <p>1B</p> <p>(continued)</p>	<p>Checking homework</p> <p>PB 4.3, Q2 (b) False, $35, 8 \times (6 - 2 + 3) = 56$</p> <p>PB 4.3, Q2 (b) False, $56, 64 - (10 + 2) = 52$</p> <p>PB 4.3, Q8 (a) $13 - (4 - 1) = 10$</p> <p>PB 4.3, Q8 (b) $30 - (9 + 2) = 19$</p> <p>PB 4.3, Q8 (c) $60 \div (6 \div 3) = 30$</p> <p>PB 4.3, Q10 (a) $0.6x + 0.8 = 3.2$ (-0.8)</p> <p style="padding-left: 150px;">$0.6x = 2.4$ $(\div 6)$</p> <p style="padding-left: 150px;">$x = 4$</p> <p style="padding-left: 50px;">Check: $4 \times 0.6 = 0.8 = 2.4 + 0.8 = 3.2$</p> <p>Some of the solutions:</p> <p>(1) $-2 + 2 + 2 + 2$</p> <p style="padding-left: 40px;">$2 - 2 + 2 + 2$</p> <p style="padding-left: 40px;">$2 + 2 - 2 + 2$</p> <p style="padding-left: 40px;">$2 + 2 + 2 - 2$</p> <p>(2) $2 + 2 + (2 - 2)$</p> <p style="padding-left: 40px;">$2 + (2 - 2) + 2$</p> <p style="padding-left: 40px;">$(2 - 2) + 2 + 2$</p> <p>(3) $2 + 2 - (2 - 2)$</p> <p style="padding-left: 40px;">$2 - (2 - 2) + 2$</p> <p style="padding-left: 40px;">$-(2 - 2) + 2 + 2$</p> <p>(4) $(-2 + 2 + 2) \times 2$</p> <p style="padding-left: 40px;">$(2 - 2 + 2) \times 2$</p> <p style="padding-left: 40px;">$(2 + 2 - 2) \times 2$</p> <p>(5) $(2 + 2) \div 2 + 2$</p> <p style="padding-left: 40px;">$2 + (2 + 2) \div 2$</p> <p>(6) $2 \times 2 - 2 + 2$</p> <p style="padding-left: 40px;">$2 \times 2 + 2 - 2$</p> <p style="padding-left: 40px;">$-2 + 2 \times 2 + 2$</p> <p style="padding-left: 40px;">$2 + 2 \times 2 - 2$</p> <p style="padding-left: 40px;">$-2 + 2 + 2 \times 2$</p> <p style="padding-left: 40px;">$2 - 2 + 2 \times 2$</p> <p>(7) $(2 + 2) \times 2 \div 2$</p> <p style="padding-left: 40px;">$(2 + 2) \div 2 \times 2$</p>	<p>Notes</p> <p>T has asked a P to write correct solutions on BB for Q2 and Q8 as soon as P arrives.</p> <p>Agreement, feedback, self-correction. Praising.</p> <p>Then a volunteer P shows the solution to Q10 (a) by balancing the equation (and checking).</p> <p>To check the possible ways of producing the number 4 from four 2s, T has prepared an OS showing some solutions. This is put on OHP and Ps tick the matching solutions in their Ex.Bs.</p> <p>Now only the different solutions remain to be checked (stronger Ps who have used the 2^2 form .. must be praised).</p>

Y8	UNIT 4 <i>Rounding and Estimating</i> Lesson Plan 5	<i>Problems in Context</i>
Activity		Notes
3	<p>Problems in context - individual work</p> <p>PB 4.4, Q5 (b) $(12 + 0.14 \times 82 = 23.48$ <i>Prakesh is paid £23.48)</i></p> <p>PB 4.4, Q7 $(10 - (1.50 + 2.45 + 0.80) = 5.25$ <i>Joanne should get £5.25 change)</i></p> <p style="text-align: right;">26 mins</p>	<p>Individual work, monitored, helped.</p> <p>Checking at BB: volunteer P dictates (T writes on BB) expression written as answer → agreement, feedback, self-correction, praising. Process repeated for second task.</p>
4	<p>Problems in context - mental work</p> <p>T: See if you can work this out in your head.</p> <p>T (reads aloud):</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>(a) Liam buys 40 boxes of chocolates, costing £1.29 each. What is the total cost?</p> </div> <p>P₁: $£1.29 \times 40$ P₂: £51.60 P₃: $1.30 \times 40 - 0.01 \times 40$</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>(b) How many bottles, each with a capacity of 0.7 litres are needed to store 7.5 litres of liquid?</p> </div> <p>P₁: $7.5 \div 0.7$ P₂: 11 P₃: $0.7 \times 10 = 7$, plus 1 for the remaining half a litre. 8 bottles are needed.</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>(c) A book costs £13.40. How many books can you buy with £280?</p> </div> <p>P₁: $280 \div 13.4$ P₂: 20 P₃: $14 \times 20 = 280$ $13.4 \times 20 = 268$. The remaining £12 is not enough for another book, so you can buy 20 books.</p> <p style="text-align: right;">36 mins</p>	<p>Mental work (slower Ps can use their Ex.Bs.)</p> <p>T says/reads out the first task slowly, waits for Ps to think, asks for the calculation that will lead to the solution, waits for thinking, then asks the results and the quickest way to get it.</p> <p>Continue in the same way for (b) and (c).</p> <p>Praising. (T should also praise those Ps who needed to write to find the solution.)</p>
5	<p>Using brackets when solving problems in context</p> <p>T: Now you can use your Ex.Bs. Read the question carefully, and then write down an expression which will give the solution. See if you can find a quick method!</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>Margaret buys 3 balls for her grandchildren, costing £4.68 each. She pays for them with three £5 notes. How much change should she have?</p> </div> <p>P₁ (writes on BB): $5 \times 3 - 4.68 \times 3$ P₂ (writes on BB): $= (5 - 4.68) \times 3 = 0.32 \times 3 = 0.96$ Margaret should have 96p change.</p> <p style="text-align: right;">41 mins</p>	<p>Whole class activity.</p> <p>Task appears on OHP.</p> <p>Ps discuss the problem together, and suggest an appropriate expression. Then T asks Ps to use brackets to make the calculation easier.</p> <p>Praising.</p>

Y8	UNIT 4 <i>Rounding and Estimating</i> Lesson Plan 5	<i>Problems in Context</i>
Activity 6	<p>Individual work</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p>Jim has two rectangular gardens, one has sides of length 38 m and 34.7 m, the other with sides of length 65.3 m and 38 m.</p> <p>What is the total area, in m^2, of Jim's gardens?</p> </div> <p>$P_1: A = 38 \times 34.7 + 65.3 \times 38 \text{ (m}^2\text{)}$</p> <p>(T writes on BB.)</p> <p>T (to the Ps who are not objecting): Why do you think the other are disagreeing with this?</p> <p>P_2: Because they enjoy multiplying.</p> <p>T: Don't you?</p> <p>P_2: No!</p> <p>T: Is there another way we can find the answer?</p> <p>P_2: Using brackets ...(writes on BB):</p> $= (34.7 + 65.3) \times 38 = 100 \times 38 = 3800 \text{ m}^2$ <p style="text-align: right;">45 mins</p>	<p style="text-align: center;">Notes</p> <p>Task appears on OHP.</p> <p>Quick-fire individual work.</p> <p>T monitors work and helps slower Ps to write down expression which gives the solution.</p> <p>Ps using brackets will find the answer quickly. After two or three minutes, T stops the work and asks for the expressions Ps have written in Ex.Bs.</p> <p>Discussion follows.</p> <p>Agreement, completing solution. Feedback. Praising.</p>
	<p>Set homework</p> <p>PB 4.4, Q3</p> <p>PB 4.4, Q6</p> <p>PB 4.4, Q8</p> <p>PB 4.4, Q10</p>	

Y8	UNIT 4 <i>Rounding and Estimating</i> Lesson Plan 6	<i>Rounding and Estimating 1</i>												
Activity		Notes												
1	<p>Checking homework</p> <p>PB 4.4, Q3 Expression: 6.99×30</p> <p>PB 4.4, Q6 " $110 \div 17$</p> <p>PB 4.4, Q8 " $3.25 + 0.40 \times 25$</p> <p>PB 4.4, Q10 " $20 \times 3 - 8.99 \times 6$</p> <p>P (Q3): $= 7 \times 30 - 0.01 \times 30 = 209.70$</p> <p>P (Q6): $6 + 1 = 7$</p> <p>P (Q8): £13.25</p> <p>P (Q10): $= 10 \times 6 - 8.99 \times 6 = (10 - 8.99) \times 6 = 6.06$</p> <p style="text-align: right;">6 mins</p>	<p>T has asked one of Ps to write on BB just the expressions they wrote down when doing the homework.</p> <p>After agreement and self-correction, T asks the results and the quickest way to get them, for Q3 and Q10.</p> <p>If Ps have not found a quick way for Q10, T can lead them to it with, for example, the question, "Will it matter if Alison pays with six £10 notes instead of three £20 notes?"</p> <p>Agreement, self-correction. Praising.</p>												
2	<p>Estimating and rounding</p> <p>T: A book costs £13.40. How many books can you buy with £280 ? Is this calculation familiar to you? In the last lesson we said that $14 \times 20 = 280$, so we know that we can buy 20 books. After calculating 13.4×20, we realised that there was not enough left to buy another book.</p> <p>What were we doing when we used 14 instead of 13.4 ?</p> <p>Ps: We were estimating.</p> <p>T: Was this a rounding?</p> <p>Ps: Yes, but it was incorrect.</p> <p>T: Was it useful?</p> <p>Ps: Yes.</p> <p>T: What did we do?</p> <p>Ps: We overestimated the price of a book to ensure that we could buy 20 of them.</p> <p>T: Now we'll round correctly. Can you remember how we do it? Let's see ...</p> <p>(a) Round each of the following numbers to the nearest hundred:</p> <table><tr><td>T: 319</td><td>Ps 300</td></tr><tr><td>471</td><td>500</td></tr><tr><td>800</td><td>800</td></tr><tr><td>56</td><td>100</td></tr><tr><td>41</td><td>0</td></tr><tr><td>3462</td><td>3500</td></tr></table> <p>T: What have you done?</p> <p>P₁: We had to decide which hundred was nearest to each of the numbers.</p> <p>P₂: The digit of the hundred in the number remained unchanged if the tens digit was 0, 1, 2, 3 or 4. Otherwise, it was rounded up.</p> <p>(continued) T: 550 Ps: 600</p>	T: 319	Ps 300	471	500	800	800	56	100	41	0	3462	3500	<p>A short discussion about estimating and rounding.</p> <p>Mental work (revision) with all Ps contributing.</p> <p>First, volunteer Ps answer the questions, then, after recalling the rule of rounding (with discussion), T points to Ps to answer.</p>
T: 319	Ps 300													
471	500													
800	800													
56	100													
41	0													
3462	3500													

Y8	UNIT 4 <i>Rounding and Estimating</i> Lesson Plan 7	<i>Rounding and Estimating 2</i>
<p>Activity</p> <p>3</p> <p><i>(continued)</i></p>	<p>T: How much did he actually pay?</p> <p>P₄ (at BB or aloud): 0.90 0.81 + 1.20 <u>2.91</u></p> <p>T: Was it a good estimate?</p> <p>Ps: Yes.</p> <p>T: Now for Robert's bill.</p> <p>P₅: 0.85 → 1 P₆: 0.50 → 1 p₇: 0.52 → 1 Ps: £3 in total.</p> <p>P₄ (at BB or aloud): 0.85 0.50 + 0.52 <u>1.87</u></p> <p>T: This is quite a way from the estimate, isn't it? Why is it so different?</p> <p>T: 0.85 Ps: 1 0.50 0.50 0.52 0.50</p> <p>Ps: £2 is much closer to the actual total.</p> <p style="text-align: right;">18 mins</p>	<p>Notes</p> <p>... T asks, Ps volunteer to round and calculate the actual total, T agrees and praises.</p> <p>T and Ps discuss how they could arrive at a more accurate estimate and agree that rounding to the nearest 50p would be better here.</p> <p>Rounding, agreeing, praising.</p>
<p>4</p>	<p>Individual practice with rounding</p> <p>Activity 4.3</p> <p style="text-align: right;">28 mins</p>	<p>Whole class activity, monitored, helped.</p> <p>Each P has a copy of Activity 4.3. Ps who finish the estimate can go on to the Extension.</p> <p>Verbal checking of the till listing estimate: T points to Ps to give the next rounding, other Ps check/correct. Agreeing the estimate, feedback, praising.</p> <p>Then a volunteer stronger/faster P gives the result of rounding to nearest 50p.</p> <p>Agreement, feedback, self-correction. Praising.</p>
<p>5</p> <p><i>(continued)</i></p>	<p>More complicated estimations</p> <p>T: Now we're going to estimate the result of more complicated expressions.</p> <p>OS 4.8, Rows 1-4</p>	<p>Whole class activity, mental work wherever possible.</p> <p>Task appears on OHP.</p> <p>Slower Ps are encouraged to come to OS and give estimates for the easier parts, stronger Ps do the more difficult ones.</p>

Y8	UNIT 4 <i>Rounding and Estimating</i> Lesson Plan 7	<i>Rounding and Estimating 2</i>
Activity 5 <i>(continued)</i>	<p> $P_1: 7 \times 4 = 28$ Ps: 29.2, correct $P_2: \frac{8 \times 10}{2} = 40$ 37.5, correct $P_3: \frac{3 + 8}{10 - 5} = \frac{11}{5} = 2.2$ 2.35, correct $P_4: \frac{10 \times 7}{4 + 4} = \frac{70}{8} = 8.75$ 9.16, correct </p> <p> T: Let's look at the last of these, and change the final number by 1 tenth (writes on BB): </p> $\frac{9.8 \times 7.4}{3.5 + 4.52}$ <p> P_5 (at BB): $\frac{10 \times 7}{4 + 5} = \frac{70}{9} \approx 7.78$ </p> <p> Ps: The result is 9.04, correct to 3 s.f. The estimate is not close. T: What was the mistake? <i>(Numbers should have been rounded to the nearest 0.5, or the sum in the denominator should have been rounded 'as a sum'</i> <i>i.e. $3.5 + 4.53 \approx 8$, $\frac{70}{8} = 8.75$)</i> </p> <p style="text-align: right;">39 mins</p>	<p style="text-align: center;">Notes</p> <p>After each estimate, all Ps use their calculators, agree the result correct to 3 s.f. (T writes it on OS) and decide if the estimate was accurate enough.</p> <p>After checking P_4's estimate, T starts a discussion.</p>
6	<p>Individual work with estimations</p> <p>PB 4.6, Q1 (a) Estimate: $5 \times 8 = 40$ Calculator: 39.2</p> <p>PB 4.6, Q6 (b) Estimate: $\frac{7 + 9}{2} = 8$ Calculator: 7.13</p> <p>(c) Estimate: $\frac{60 \times 20}{30} = 40$ Calculator: 38.2 <i>(all to 3 s.f.)</i></p> <p>For stronger Ps, when they have completed the questions: OS 4.8, row 5.</p> <p><i>With the product of 116×3461 in the numerator and the difference of $984 - 623$ in the denominator, an estimate of $\frac{100 \times 3500}{350}$ seems sensible.</i></p> <p style="text-align: right;">45 mins</p>	<p>Individual work, monitored, helped.</p> <p>OS 4.8 remains on OHP, and stronger Ps are asked to find an accurate method of estimation, when they have finished the set PB questions.</p> <p>Checking: solution appears on OHP or T writes it quickly on BB.</p> <p>Self-correction, feedback. Praising.</p> <p>Then T asks if anyone can find a sensible estimate for the extra question. If no response, T leads Ps to it.</p> <p>Praising.</p>
	<p>Set homework</p> <p>PB 4.6, Q1 (b)</p> <p>PB 4.6, Q3</p> <p>PB 4.6, Q6 (a), (e)</p>	<div style="border: 1px solid black; padding: 10px; margin-top: 20px;"> <p><i>Scientific calculators will be needed for the next lesson.</i></p> </div>

Y8	UNIT 4 <i>Rounding and Estimating</i> Lesson Plan 8	<i>Calculator Logic</i>
Activity 1	<p>Checking homework:</p> <p>PB 4.6, Q1 (b) Estimate: $10 \times 20 = 200$ Calculator: 206</p> <p>PB 4.6, Q3 Estimate: $4 \times 5 = 20$ Calculator: 17.0</p> <p>PB 4.6, Q6 (a) Estimate: $\frac{6 \times 3}{4} = 4.5$ Calculator: 4.94</p> <p>(e) Estimate: $\frac{140 - 90}{20} = 2.5$ Calculator: 2.05 (all to 3 s.f.)</p> <p style="text-align: right;">5 mins</p>	<p>Notes</p> <p>T has asked one of Ps to write down estimation method, estimate and the result correct to 3 significant figures on BB for each task as soon as P arrives.</p> <p>Agreement/correction.</p> <p>Feedback, self-correction.</p> <p>Praising.</p> <p>Discussion:</p> <ul style="list-style-type: none"> - why do we round to the nearest whole number in Q6 (a) and to 10 in (e)? - would the product of 3.5×5 be a more accurate estimate for 3.61×4.72 ?
2	<p>Mental work with estimations</p> <p>PB 4.6, Q5 (A, B, D and E all incorrect)</p> <p>e.g:</p> <p>T: Let's look at Kyle's first calculation ... (waits for thinking) ... Who thinks that he's done it correctly? Who thinks it's not correct? ... Why? ...</p> <p style="text-align: right;">12 mins</p>	<p>Mental work.</p> <p>Task appears on OHP with only question A uncovered at first, and other questions shown when appropriate.</p> <p>T asks, give Ps time to think (slower Ps can use their Ex.Bs) then Ps vote 'Yes' or 'No'; T asks for reasons for their decision.</p> <p>T and Ps talk about the method of estimation, e.g. rounding the members of an expression to the same significant figure and not to the same decimal place (see 82.3×0.625, where the 80×0.6 estimation may seem the most sensible).</p> <p>Agreement. Praising.</p>
3	<p>Using scientific calculators</p> <p>T: Kyle has made lots of incorrect calculations, hasn't he? Do you know how to use your calculator?</p> <p>Now you will not be able just to write down the final answer. Switch on your calculator and then we'll do some work.</p> <p>Worked Examples 1 and 2 on p77 of Y8A PB.</p> <p style="text-align: right;">20 mins</p>	<p>Whole class activity.</p> <p>Each P must have a scientific calculator for this lesson.</p> <p>T writes Worked Example 1 on BB and asks Ps for a solution. T introduces bracket keys on calculator, their properties (error message if they are not in pairs) and the memory keys. T helps Ps who are not familiar with this.</p> <p>Ps now work in pairs and help each other find out the way their calculators work.</p> <p>(Solutions to Worked Examples are given in PB.)</p>

Y8	UNIT 4 <i>Rounding and Estimating</i> Lesson Plan 8	<i>Calculator Logic</i>
<i>Activity</i>		<i>Notes</i>
4	<p>Practice using scientific calculators</p> <p>PB 4.7, Q1 (a) 45.9 (d) 5.57 (2 d.p.) (e) 1.08 (2 d.p.) (using bracket keys)</p> <p>PB 4.7, Q2 (a) 0.509 (3 s.f.) (d) 0.155 (3 s.f.) (using memory keys)</p> <p style="text-align: right;">27 mins</p>	<p>Whole class activity.</p> <p>T asks Ps, volunteer P suggests solution, T waits for others to agree or correct. Then all Ps use their calculators to get an answer.</p> <p>Compare final results: feedback → correcting, praising.</p>
5	<p>Step-by-step calculations</p> <p>PB 4.7, Q1 (b), (c) (b) 6.27 (2 d.p.) (c) 7.67 (2 d.p.)</p> <p>PB 4.7, Q2 (b), (c) (b) 0.522 (3 s.f.) (c) 3.05 (3 s.f.)</p> <p>e.g. for Q1 (b)</p> <p>Ps (dictate, T writes/draws):</p> <p>Press the following keys:</p> <p>two - multiplication - four - seven - division - bracket - six - addition - nine - bracket.</p> <p style="text-align: right;">36 mins</p>	<p>Individual work, monitored, helped.</p> <p>Ps have to write down just the results.</p> <p>When checking, T asks Ps how they got their answers and Ps dictate (T writes on BB, Ps in Ex.Bs) a set of instructions for each calculation.</p>
6	<p>Revision of significant figures and estimation</p> <p>M 4.2, extended with Q7:</p> <p>Q7. Give an estimate for the following expressions:</p> <p>(a) $13.237 + 26.89$</p> <p>(b) 0.341×0.415</p> <p>(c) $8.24 \div 0.21$</p> <p>(d) $(12.12 + 28.3) \times 1.5$</p> <p><i>Solution of Q7:</i></p> <p>(a) $13 + 27 = 40$</p> <p>(b) $0.3 \times 0.4 = 0.12$</p> <p>(c) $8 \div 0.2 = 40$</p> <p>(d) $(12 + 28) \times 1.5 = 40 \times 1.5 = 60$</p> <p style="text-align: right;">45 mins</p>	<p>Mental work; with T making Ps revise the new topics.</p> <p>T asks/reads out questions from M 4.2; Extension question appears on OHP. T points to P, P answers, T agrees/waits for correction and praises, question by question.</p>
	<p>Set homework</p> <p>Give two sets of instructions, using bracket keys and memory keys, for carrying out each of the following calculations using a calculator:</p> <p>PB 4.7, Q1 (f)</p> <p>PB 4.7, Q3 (a), (b)</p>	