Bk4	R: Mental calculation **C: Revision: numbers to 1000. Writing and ordering. Rounding** *E: Numbers up to 2000*	*Lesson Plan* *1*

Activity		*Notes*
1	**Combinatorics** In how many different ways can we write the word 'ONE' if we can read the letters by taking one step to the right or 1 step down? Ps come to BB to show the different ways. Who agrees? Who can think of another way? etc. Agree that there are 4 ways. BB: a) ONE [ONE ON O O / E NE N / E] 4 different ways We can show them as one diagram like this. BB: ONE / NE / E Class checks that all the 4 possible ways are shown. Let's think of how many different ways we can get to each position. T points to each letter in turn and Ps say how many different ways they can get to it. T writes as numbers on BB. T circles the 'end' numbers and writes it as an addition. BB: ONE 1 1 1 NE 1 2 E 1 $1 + 2 + 1 = \underline{4}$ Repeat for 4-letter and 5-letter words, e.g. b) MORE 1 1 1 1 ORE 1 2 3 RE 1 3 E 1 $1 + 3 + 3 + 1 = \underline{8}$ (different ways) c) SUGAR 1 1 1 1 1 UGAR 1 2 3 4 GAR 1 3 6 AR 1 4 $1 + 4 + 6 + 4 + 1 = \underline{16}$ (different ways) R 1	Whole class activiry Words written on BB or letters on cards stuck to BB. Agreement, praising Ps may notice the easiest way of calculation of the possible cases by themselves. The numbers show the number of routes to that place. Ps could suggest the words.
	9 min	
2	**Problems** Listen to the problem. Think about how you would work out the answer. a) I *divided 10 into two parts, then I divided one part by the other part. The quotient is 4. What are the two numbers?* T asks several Ps what they think (or the numbers could be written on slates and shown in unison). P answering correctly explains method of solution to the others. Who did the same? Who did it a different way? etc. e.g. i) *Trial and error 1:* $10 = 7 + 3$ but $7 \div 3 \neq 4$ $= 8 + 2$ and $8 \div 2 = 4$ ✔ ii) *Trial and error 2:* ✔ Rule: $b = 4 \times a$ a: 1, 2, 3 — b: 4, 8, 12 *Check:* $2 + 8 = 10$ *iii) Equation:* $a + 4 \times a = 10$ $5a = 10$ $a = \underline{2}$ so one number is 2 and the other is $10 - 2 = \underline{8}$ (or $4 \times a = \underline{8}$)	Whole class activity (or individual trial first if Ps wish) Give Ps time to think. Discussion. Ps come to BB or dictate what T should write. Reasoning, agreement, praising Accept all correct methods but stress most logical method using an equation. T shows it if no P suggests it.

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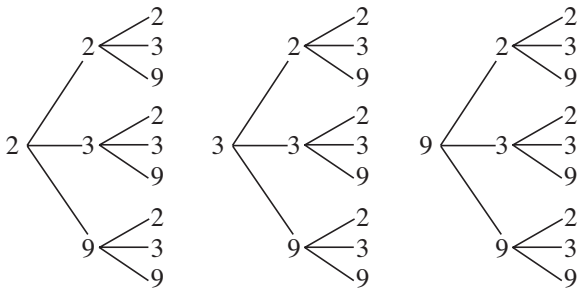
Bk4		*Lesson Plan 1*
Activity		***Notes***
	b) *I subtracted an even number from an odd number. Then I multiplied the difference by thirteen. Next I doubled the product. Was the result an even or an odd number?* T asks several Ps what they think. Why do you think so? Who agrees? Who thinks something else? etc. (It must be even as any number multiplied by 2 has an even result. Only the last step (doubling) is important!) Ps may check it if they wish. e.g. BB: $9 - 6 = 3$, $3 \times 13 = 39$, $39 \times 2 = \underline{78}$, which is <u>even</u>.	Whole class activity Give Ps time to think. Discussion, reasoning, agreement, checking, praising Extra praise if Ps notice this without help.
	18 min	
3	**Making 3-digit numbers** a) Let's make 3-digit numbers from these number cards. BB: 3 9 2 Letr's write them in increasing order. Ps dictate to T: BB: $239 < 293 < 329 < 392 < 923 < 932$ Agree that there are 3 possible hundreds digits, then for every hundreds digit there are 2 possible tens digits, then for every tens digit there is only one possible units digit, i.e. $3 \times 2 \times 1 = \underline{6}$ possible numbers. b) How many 3-digit numbers can we make from 3 digits if we can use a digit more than once? What kind of diagram can we draw to help us? (<u>Tree diagram</u>) Who remember how to draw it? BB:  Agree that there are <u>27</u> possible numbers. Could we have reasoned <u>without</u> drawing the tree diagram? (We had 3 possible choices for the hundreds digit, then 3 choices for the tens digit, then 3 choices for the units digit, i.e. $3 \times 3 \times 3 = \underline{27}$.) T shows in table on BB. Who can think of questions to ask about these numbers? e.g. • How many are even (odd)? (9, 18) • What fraction of them are even (odd)? (1 third, 2 thirds) • How many have all 3 digits the same? (3) Discuss place value and real value. e.g. $222 = 200 + 20 + 2$ • How many are divisible by 3 (4)? (8, 6)	Whole class activity Number cards stuck on BB (Ps could have the number cards on desk too.) Reasoning, agreement, praising Ps suggest strategy and draw it on BB and in *Ex. Bks.* with T's help if necessary. At a good pace Reasoning, agreement, praising BB: H | T | U 3 × 3 × 3 T gives hints if Ps cannot think of any. Praise all contributions. Extra praise for clever questions.
	24 min	
4	***Book 4, page 1*** Q.1 Read: *Write the numbers in the place value table.* Review at BB with whole class. Ps come out to write in the numbers, explaining reasoning. Who made a mistake? What kind of mistake? Deal with all cases. Lets read the numbers in increasing (decreasing) order.	Individual work, monitored (helped) Use enlarged copy master/OHP Agreement, self-correction, praising In unison, at speed Feedback for T
	29 min	

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Bk4

Lesson Plan 1

Activity		*Notes*
5	***Book 4, page 1*** Q.2 Read: *Write these numbers as digits and list them in increasing order.* T could choose a P to read each number aloud and Ps could write as digits above the words. Then Ps list in order. Review at BB with whole class. Ps dictate what T should write. Mistakes discussed and corrected BB: $98 < 560 < 605 < 777 < 1418$	Individual work, monitored, helped Agreement, self-correction, praising
Extension	Let's round the numbers to the nearest hundred (ten). T points to each number in turn and Ps say the rounded value.	Ps chosen at random. At speed. Class points out errors.
	34 min	
6	***Book 4, page 1*** Q.3 Read: *Write these numbers in the correct sets.* Deal with one part at at a time. Set a time limit. Review at BB with whole class. Mistakes discussed and corrected. *Solution:* {6, 10, 54, 109, 468, 893, 1000, 1302, 1517, 1999} a) 6, 10, 54, 468 / 1000, 1302 / 109, 893, 1517, 1999 (Even numbers / Odd numbers) b) 1000, 1302, 1517, 1999 / 6, 10, 54, 109, 468, 893 (4-digits / Not 4-digits) c) 10, 1000, 1302, 1517 / 1999, 109, 6, 54, 468, 893 (Has the digit 1 / Has no digit 1) d) 6, 10, 54, 109 / 468, 893, 1000, 1302, 1517, 1999 (Not greater than 1000 / Greater than 1000)	Individual work, monitored, helped Drawn on BB or use enlarged copy master or OHP Discussion, agreement, self-correction Praising only for numbers beyond 1000.
	40 min	
7	***Book 4, page 1, Q.4*** Read: *Study the numbers. Are the statements true or false? Write T or F in each box.* T chooses a P to read statement aloud. Is it true or false? Show me . . . now! (on slates or scrap paper) a) There is at least one number which is odd. (T) b) All the numbers are even. (F) c) None of the numbers is more than 1500. (T) d) There are no whole tens. (F) e) Not every number is odd. (T) Who can think of another statement which means the same as (i.e. is <u>equivalent</u> to) this one? T points to each in turn. Ps suggest statements. Class decides whether it is equivalent. e.g. a) There is at least one number which is odd. (Not every number is even.)	Whole class activity (or individual work if Ps wish) In unison. Ps give reasons for their answers. (e.g. 23 is odd) (e.g. 23 is not even) (the largest, $1499 < 1500$) (e.g. 1240 is a whole ten) (e.g. 802 is even) BB: <u>equivalent</u> (means the same) N.B. 0 is even and can be thought of as no whole ten.
	45 min	

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Bk4	R: Mental calculation **C: Numbers up to 1000. Comparison. Rounding** *E: Numbers up to 2000. Roman numerals*	*Lesson Plan* *2*
Activity		***Notes***
1 **Extension**	**Writing numbers** a) T dictates numbers up to 1000 (2000) and Ps write them in *Ex. Bks*. Review at BB with whole class. Mistakes discussed and corrected. b) Ps dictate numbers and choose other Ps to write them as digits on the BB. Class agrees/disagrees. T points to some of numbers on BB and Ps round to nearest 10 (100). *8 min*	Individual writing but class kept together. T could have numbers already prepared on SB/OHT. Discussion, agreement, self-correcting, praising At a good pace!
2	**Find the mistakes** *Birdy* has tried to write the same number in different ways but he has make a couple of mistakes. Let's help him to find and correct them. Ps come to BB to underline the mistake, say why it is wrong and then to write it again correctly. Class agrees/disagrees. BB: a) 7 hundred + 1 thousand + 3 units ✔; 1 × 1000 + 7 × 10 (7 × 100) + 3 × 1; ✗ 17 hundreds + 3 units; ✔ one thousand seven hundred and 3; ✔ 1000 + 700 + 3; ✔ 1 thousand + 70 tens + 3 units ✔ b) 1 × 1000 + 4 × 100 + 3 × 10 + 4 × 1; ✔ 143 tens + 4 units; ✔ one thousand, four hundred and thirty one ✗; 1000 + 400 + 30 + 4; ✔ 14 hundreds + 34 ✔ (four) *13 min*	Whole class activity Written on BB or SB or OHT or use enlarged copy master At a good pace Reasoning, agreement, praising Feedback for T
3	***Book 4, page 2*** Q.1 Read: *Fill in the missing numbers, then list them in decreasing order.* Set a time limit. Ps write numbers in boxes first. Review with whole class. Mistakes discussed and corrected. BB: $8 \times 100 + 5 \times 10 = \underline{850}$ $3 \times + 7 \times 1 = \underline{307}$ $8 \times 100 + 5 \times 1 = \underline{805}$ $3 \times 100 + 7 \times 10 = \underline{370}$ $1 \times 1000 + 6 \times 10 = \underline{1060}$ $1 \times 1000 + 8 \times 100 = \underline{1800}$ $1 \times 1000 + 6 \times 1 = \underline{1006}$ $1 \times 100 + 8 \times 10 = \underline{180}$ Then Ps list in decreasing order in *Pbs*. Review at BB with whole class. Ps dictate to T or come to BB. Mistakes corrected. BB: 1800 > 1060 > 1006 > 850 > 805 > 370 > 307 > 180 *18 min*	Individual work, monitored Differentiation by time limit Operations written on BB or SB or OHT Encourage Ps to say the whole equation. Make sure that mistakes are corrected before Ps order the numbers. Individual work, monitored Agreement, self-correction, praising
4	***Book 4, page 2*** Q.2 Read: *Fill in the missing numbers, then list them in increasing order.* Set a time limit. Ps write numbers in boxes first. Review with whole class. Mistakes discussed and corrected. BB: $600 + 30 = \underline{630}$ $1000 + 500 + 4 = \underline{1504}$ $300 + 60 = \underline{360}$ $1000 + 40 + 5 = \underline{1045}$ $600 + 3 = \underline{603}$ $1000 + 900 + 1 = \underline{1901}$ $300 + 6 = \underline{306}$ $1000 + 90 + 1 = \underline{1091}$ Then Ps list in decreasing order in *Pbs*. Review at BB with whole class. Ps dictate to T or come to BB. Mistakes corrected. BB: 306 < 360 < 603 < 630 < 1045 < 1091 < 1504 < 1901 *23 min*	Individual work, monitored Differentiation by time limit Operations written on BB or SB or OHT Encourage Ps to say the whole equation. Make sure that mistakes are corrected before Ps order the numbers. Agreement, self-correction, praising

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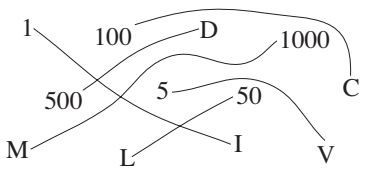
Bk4		*Lesson Plan 2*
Activity		***Notes***
5	**Sum of digits is 2** In your *Ex. Bks*. write all the numbers up to 1000 which have 2 as the sum of their digits. Ps dictate their numbers and T writes them on BB. BB: 2, 11, 20, 101, 110, 200 Are there any more? (No) Now write all the numbers from 1000 to 2000 which have 2 as the sum of their digits. Ps dictate their numbers and T writes them on BB. BB: 1001, 1010, 1100, 2000 *27 min*	Individual trial in *Ex. Bks* first then whole class review. Ps correct wrong numbers or add those missed. Agreement, praising Or done as a whole class activity. Agreement, praising
6 **Extension**	***Book 4, page 2*** Q.3 Read: *Write the whole numbers up to 1000 which have the sum of their digits as 3*. Review at BB with whole class. Ps dictate numbers or come to BB. Class agrees/disagrees. Mistakes discussed/corrected. BB: 3, 12, 21, 30, 102, 111, 120, 201, 210, 300 Repeat for 1000 to 2000: 1002, 1011, 1020, 1101, 1110, 1200 *32 min*	Individual work, monitored Ps correct wrong numbers or add those missed. Agreement, praising Whole class activity, with Ps dictating numbers to T to write on BB.
7	**Equal values** Study these numbers. Let's join up the equal values. Ps come to BB to draw joining lines and to explain reasoning. Class points out errrors. BB:  Quick revision of Roman numerals . Let"s see what you remember! (I = 1, V = 5, X = 10, L = 50, C = 100, D = 500, M = thousand; VI = V + 1 = 6; IV = V – 1 = 4, etc.) a) T writes Roman numbers on BB and Ps say them as Arabic numbers. (e.g. LVII, CCXXXI, XLIX, etc.) b) T (or P) says Arabic numbers and Ps write them as Roman numerals. (e.g. 79, 458, 950, 1555, etc.) *36 min*	Whole class activity Drawn on BB or use enlarged copy master or OHP At a good pace Agreement, praising Discussion. Involve several Ps. Allow Ps to tell class what they know. T chooses Ps at random. Class points out errors. At a good pace Agreement, praising
8	***Book 4, page 2*** Q.4 Read: *Write the Roman numerals as Arabic numbers*. Set a time limit. Review at BB with whole class. Ps come to BB to fill in numbers, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected. Details shown on BB if problems. *Solution:* a) CV = 105 b) CXXXIX = 139 c) CXLVIII = 148 d) DCLX = 660 e) CMIX = 909 f) MCMXCVIII = 1998 (Or done as a whole class activity if Ps are still unsure.) *40 min*	Invidual work, monitored, helped Differentiation by time limit T has BB or SB or OHT already prepared Reasoning, agreement, self-correction, praising Details: e.g. DCLX = 500 + 100 + 50 + 10 = 600 + 60 = 660 CMIX = 1000 – 100 + 10 – 1 = 900 + 9 = 909

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Bk4		*Lesson Plan 2*
Activity		***Notes***
9	***Book 4, page 2*** Q.5 Read: *Write the numbers which have:* *a) an even digit as their hundreds digit and 500 as their nearest ten.* *b) an odd digit as their hundreds digit and 500 as their nearest ten.* *c) the smallest even digit as their tens digit and 1010 as their nearest ten.* Deal with one part at a time. Ps write numbers in *Pbs*. Review at BB with whole class. **A**, what numbers did you write? Who agrees? Who thinks another number? Let's check them! Mistakes corrected and omissions added. *Solution:* a) 495, 496, 497, 498, 499 b) 500, 501, 502, 503, 504 c) 1005, 1006, 1007, 1008, 1009	Individual trial first, monitored, helped (or whole class activity if time is short) Discussion, reasoning, agreement, self-correction, praising In part c) agree beforehand that 0 is the smallest even digit.
Extension	Who could write the solution to each part as an inequality?	e.g. a) $495 \leq n < 500$ Agreement, praising
	45 min	

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Bk4	R: Mental calculation **C: Numbers up to 1000. Comparison. Rounding. Sequences** *E: Numbers up to 2000*	*Lesson Plan* *3*
Activity		***Notes***
1	**Numbers with digit 1** Let's list the numbers which have 1 as one of their digits. Let's list them in increasing order. Ps dictate numbers to T who writes on BB. BB: 1, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 31, 41, 51, 61, 71, 81, 91, 100, 101, 102, 103, . . . Extra praise when Ps realise that all numbers with 1 in the units, tens, hundreds and/or thousands columns will be included! *5 min*	Whole class activity At speed round class Agreement, praising T decides when to stop! Discussion on general case.
2	**Sequences** T says first few terms of a sequence and Ps continue it. What is the rule? a) 777, 766, 755, (744, 733, 722, 711, 700, 689, 678, 667, . . .) [*Rule:* – 11] b) 32, 182, 332, (482, 632, 782, 932, 1082, . . .) [*Rule:* + 150] c) 1, 3, 7, 15, 31, (63, 127, 255, 511, 1023, 2047, . . .) [*Rule:* 2 times the previous term plus 1] (For T only: $a_{n+1} = a_n \times 2 + 1$) *12 min*	Whole class activity At speed round class If a P makes a mistake, next P corrects it. Discussion/agreement on the rule. Ps can write terms in their *Ex. Bks.* if they cannot keep them in mind. Praising, encouragement only
3	***Book 4, page 3*** Q.1 Read: *The rule for the next term in the sequence is: 3 times the previous term plus 2.* *a) Write the first six terms of the sequence if the first term is 2.* *b) Write the first six terms of the sequence if the first term is 3.* Set a time limit. Ps can do calculations in *Ex. Bks* if necessary. Review at BB with whole class. Ps come to BB or dictate terms to T. Class agrees/disagrees. Mistakes corrected. *Solution:* a) 2, 8, 26, 80, 242, 728 (All terms are even numbers) b) 3, 11, 35, 107, 322, 971 (All terms are odd) *18 min*	Individual work, monitored, helped Differentiation by time limit Or if class is less able, deal with one part at a time. Discussion, agreement, self-correction, praising Details of calculations written on BB if problems, e.g. $242 \times 3 = 600 + 120 + 6$ $= 726$ What do you notice about the terms in each sequence?
4 **Extension**	**Which digits?** T writes a string of digits on BB. Which 3 digits would you cross out so that the remaining digits make as great a number as possible without changing the order? Ps can try it in *Ex. Bks* first if they wish. **X**, come and show us which digits you think should be crossed out. What number is left? Class reads it in unison. Who agrees with **X**? Who thinks something else? etc. Repeat for other strings of digits. e.g. BB: a) 987987 → ~~98~~7~~98~~7 → 998 (Smallest: 787) b) 454532 → ~~45~~4~~53~~2 → 553 432 c) 1100345 → 1~~100~~345 → 1345 1003) Which digits would you cross out if you wanted to make the smallest number possible? *25 min*	Whole class activity T could demonstrate on BB first if Ps do not understand what to do. Reasoning, agreement, praising Ps could dictate strings of digits too! Agreement, praising

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Bk4

Lesson Plan 3

Activity		*Notes*
5	***Book 4, page 3*** Q.2 Read: *Complete the tables*. Do first 2 lines of each table with whole class first if necessary (or deal with one part at a time). Set a time limit. Review at BB with whole class. Ps come to BB or dictate to T. Mistakes discussed and corrected. If problems, show on relevant part of number line (drawn on BB). *Solution:* a) b)	Individual work, monitored (helped) Tables drawn on BB or use enlarged copy master or OHP Reasoning, agreement, self-correction, praising Agree that: 5 is rounded up to nearest 10 50 is rounded up to nearest 100 Feedback for T
6	***Book 4, page 3*** Q.3 Read: *Mark the numbers with a dot and a letter on a suitable number line*. Talk about each number line first. Elicit what the 'ticks' mean. (e.g. *top number line*: 200 to 300, small tick at every 1; *middle number line*: 400 to 500, small tick at every 5; *bottom number line*: 600 to 1600, tick at every 100) Make sure that Ps know to write only the letter above each dot and that some dots need only be approximate. Set a time limit. Review at BB with whole class. Ps come to BB to draw dots and write letters, explaining reasoning. Class agrees/disagrees. Who made a mistake? What was your mistake? Who did the same? etc. Mistakes corrected. *Solution:*	Individual work, monitored, helped (or whole class activity if Ps prefer) Drawn on BB or use enlarged copy master or OHP Discussion on distance between 'ticks' on the number lines Do *a* and *b* with whole class first if Ps are unsure. Differentiation by time limit At a good pace Reasoning, agreement, self-correcting, praising **Extension** • T (or P) points to a tick on a number line and Ps say the number. • T (or P) says a number and chooses a P to point to its position on a suitable number line. In good humour!

a)

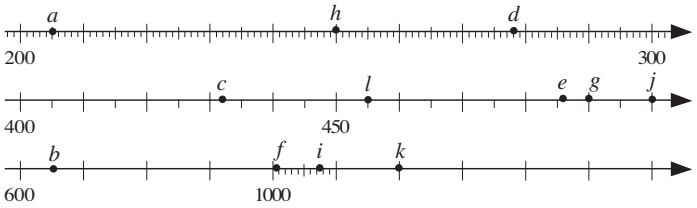
Number	Next 10		Rounded to nearest 10
	smaller	greater	
3	0	10	0
27	20	30	30
86	80	90	90
105	100	110	110
341	340	350	340
450	440	460	450
500	490	510	500
996	990	1000	1000

b)

Number	Next 100		Rounded to nearest 100
	smaller	greater	
3	0	100	0
27	0	100	0
86	0	100	100
105	100	200	100
341	300	400	300
450	400	500	500
500	400	600	500
996	900	1000	1000

35 min

$a = 205$ $b = 640$ $c = 432$ $d = 278$ $e = 486$ $f = 1005$
$g = 490$ $h = 250$ $i = 1075$ $j = 500$ $k = 1200$ $l = 455$



40 min

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Bk4

Lesson Plan 3

Activity 7

Book 4, page 3*, *Q.4

Read: *Write the numbers in the set diagram.*

Elicit that 'divisible by 5' means that there is no remainder when that number is divided by 5. Let's see how quickly we can do this!

Ps come to BB to choose a number, cross it off the list and write it in correct set, explaining reasoning. Class agrees/disagrees.

Solution:

5, 100, 909,
0, 217, 1000,
13, 352, 1215,
60, 834, 1605,
78, 900, 1780

The number is	even	odd
divisible by 5	100 60 900 1000 0 1780	5 1215 1605
not divisible by 5	352 834 78	909 217 13

T (P) points to each set in turn and Ps think of other numbers which could belong in that set.

45 min

Notes

Whole class activity

Drawn on BB or use enlarged copy master or OHP

At a good pace

Reasoning, agreement, correcting, praising

Ps can write numbers in table in *Pbs* too.

(Or individual work if Ps prefer, reviewed at BB with whole class)

In good humour!
Praising only!

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Bk4	R: Calculation **C: Numbers up to 1000** *E: Numbers up to 2000*	*Lesson Plan* *4*
Activity		***Notes***
1	**Reading and marking numbers** T has numbers written as words on BB or SB or OHT. T chooses a P to read each number, then to come to BB to write it as digits and mark its position on the number line. Class agrees/disagrees. BB: e.g. forty five, one hundred and fifty, four hundred and eighty, three hundred and twenty, eight hundred and five, seven hundred and ninety, one thousand and ten, etc. *5 min*	Whole class activity T chooses Ps at random Number line drawn on BB or OHT or use enlarged copy master or OHP At a good pace Agreement, praising Ps can choose numbers too! **Extension** minus twenty (– 20)
2	**Divisibility by 5** a) Let's list the 3-digit numbers which have 5 as the <u>sum</u> of their digits. First let's think of the possible 3-term additions. T writes on BB what Ps suggest. (e.g. BB: 1 + 4 + 0 = 5, 1 + 3 + 1 = 5, 1 + 2 + 2 = 5, 2 + 3 + 0 = 5, 5 + 0 + 0 = 5) Now we can think of the possible numbers more easily. T writes on BB what Ps suggest. BB: 104, 140, 401, 410; 113, 131, 311; 122, 212, 221; 203, 230, 302, 320; 500 Which of them are even numbers? Which of them are divisible by 5? Agree that any number which has 0 in the units column is divisible by 5. b) Lets list the 3-digit numbers which have 5 as the <u>product</u> of their digits. First let's think of the possible multiplications. What are the factors of 5? (only 1 and 5) T tells or elicits that numbers which have only 1 and the number itself as factors are called <u>prime numbers</u>. (BB) Elicit that the only possible multiplication is 1 × 5 × 1 and that the order does not matter in multiplication. What 3-digit numbers have only 1, 1 and 5 as dgits? Ps come to BB to write them. Class agrees/ disagrees. BB: 115, 151, 511 Which of them are divisible by 5? (115) Agree that all numbers which have either 5 or 0 in the units column are divisible by 5. *10 min*	Whole class activity Discussion on strategy Involve several Ps. Elicit that order in addition does not matter. Agreement, praising Elicit that none of the odd numbers are divisible by 5. Discussion on strategy Some Ps might remember this from previous years. BB: <u>Prime number</u> factors: only 1 and itself Discussion, agreement, praising

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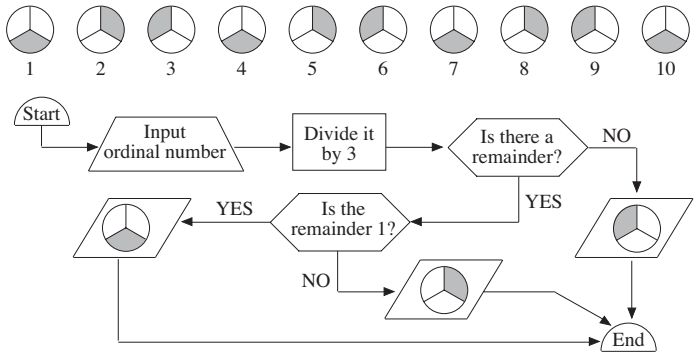
Bk4

Lesson Plan 4

Activity		*Notes*
3	***Book 4, page 4*** Q.1 Read: *Continue the pattern. Colour the correct part of the circles in the flow chart.* Ps continue the pattern first, then try to understand what the flow diagram means. T explains ordinal numbers if necessary. Review at BB with whole class. Who can explain the flow chart to us? Who knows how to colour the circles? Who agrees? Who thinks something else? T leads the whole class through the flow chart, explaining clearly and relating to the 3 types of numbers. *Solution:*  	Individual work, monitored (or whole class activity) Drawn on BB or use enlarged copy master or OHP (position in an order) Discussion, agreement, checking, self-correction, praising Demonstration of, e.g. 15, 22, 29 T says a number and Ps come to BB to show how its circle would be shaded. e.g. What would the 413th shape be? 413 = 300 + 90 + 21 + ② ✔ ✔ ✔ so shape would be
	16 min	
4	**Roman numerals** Who can write these Roman numerals as Arabic numbers? Ps come to BB to write numbers, explaining reasoning in detail. Class agrees/disagrees. Revise Roman numerals if necessary. BB: CCL = (250) CCLXXXI = (281) CCCLXIV = (364) CDVI = (406) DCCLIII = (753)	Whole class activity Written on BB or SB or OHT At a good pace Details: e.g. CDVI = 500 – 100 + 5 + 1 = 400 + 6 = <u>406</u> Agreement, praising
	20 min	
5	***Book 4, page 4*** Q.2 Read: *Continue the sequences using Roman numerals.* Set a time limit. Review at BB with whole class. Ps come to BB to write their sequence, explaining reasoning and rule. Who agrees? Who thinks something else? etc. All mistakes discussed and corrected. *Solution:* a) XLVII, LXVII, LXXXVII, (CVII, CXXVII, CXLVII, 47, 67, 87, 107, 127, 147, CLXVII, CLXXXVII, CCVII, . . .) [*Rule:* + 20] 167, 187, 207 b) CMI, DCCCI, DCCI, (DCI, DI, CDI, CCCI, CCI, 901, 801, 701, 601, 501, 401, 301, 201, CI, I) [*Rule:* – 100] 101, 1	Individual work, monitored, helped Differentiation by time limit Discussion on the rule, reasoning, agreement, self-correction, praising Feedback for T
	25 min	

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Bk4

Lesson Plan 4

Activity		*Notes*
6	**3-digit numbers** T has numbers written (or stuck) on BB: 0, 1, 2, 3, 4, 5 Choose from these numbers and make two 3-digit numbers so that: a) both are less than 300 Show me . . . now! (e.g. 250, 143) b) both are greater than 300 Show me . . . now! (e.g. 450, 321) c) both are even Show me . . . now! (e.g. 210, 534) d) the smaller number is odd and the greater number is even. Show me . . . now! (e.g. 341, 502) *30 min*	Whole class activity Ps could have number cards on desks too. Responses written on scrap paper or slates and shown in unison on command. T writes different correct solutions on BB. Agreement, praising only
7	**Specified numbers** a) In your *Ex. Bks.* write all the numbers which have the greatest odd digit in their tens column and 1000 as their nearest 10. Ps dictate to T or come to BB. (995, 996, 997, 998, 999) b) Write the number which has 900 and 1000 as the next smaller and greater hundred and which is an equal distance from both. Ps could show on scrap paper or slates on command. (950) *34 min*	Whole class activity T repeats slowly and Ps repeat in own words. Give Ps time to think. Reasoning, agreement, praising
8	***Book 4, page 4*** Q.3 Read: *Round the numbers. Complete the table.* Set a time limit. Review at BB with whole class. Ps come to BB or dictate to T. Mistakes discussed and corrected. Note the case of 1846, which rounds up to the nearest ten and nearest thousand but rounds down to the nearest hundred. *Solution:* *39 min*	Individual work, monitored, helped Table drawn on BB or use enlarged copy master or OHP Discussion, reasoning, agreement, self-correction, praising BB: 5 rounds up to nearest 10 50 rounds up to nearest 100 500 rounds up to nearest 1000
9	***Book 4, page 4*** Q.4 Read: *Write the meaning of each set label. Write another three numbers in each set.* Review at BB with whole class. Ask several Ps what they think the labels should be. Ps come to BB to write extra 3 numbers in each set. Class agrees/disagrees. *Solution:* e.g.	Individual work, monitored, helped Drawn on BB or use enlarged copy master or OHP Discussion, reasoning, agreement, self-correction praising **Bold** numbers have been added . Many others are possible – deal with all cases written by Ps.

Number	Rounded to the nearest:		
	ten	hundred	thousand
4	0	0	0
36	40	0	0
50	50	100	0
95	100	100	0
172	170	200	0
600	600	600	1000
999	1000	1000	1000
1050	1050	1100	1000
1846	1850	1800	2000

	A	B
C	420 368 **246** 716 **100 888**	6 78 1098 **12 98 1600**
D	235 851 999 **111 583 885**	3 57 1003 **67 9 1427**

A: 3-digit numbers

B: Not 3-digit numbers

C: Even numbers

D: Odd numbers

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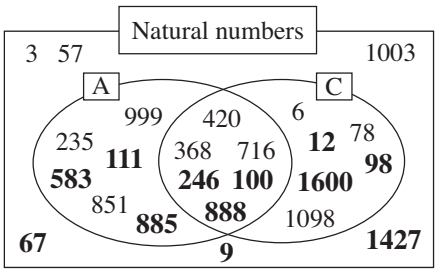
Bk4		*Lesson Plan 4*
Activity		***Notes***
9	(Continued) We could show the table in a different way using a Venn diagram. BB:  A: 3-digit numbers C: Even numbers T explains that Natural numbers are all the positive, whole numbers (1, 2, 3, 4, 5, . . .) Who can explain where the different parts of the table are in the Venn diagram? What do A and C mean? Where are the numbers in D shown? Where would we put the 9 extra numbers? etc. *45 min*	Whole class activity Drawn on BB or use enlarged copy master or OHP (If class is very able, construct the Venn diagram from scratch with Ps' help.) **Bold** numbers are added. e.g. 0, – 6, 1 quarter, 3 and a half are not Natural numbers Ps come to BB to explain, point and write. Discussion, agreement, praising

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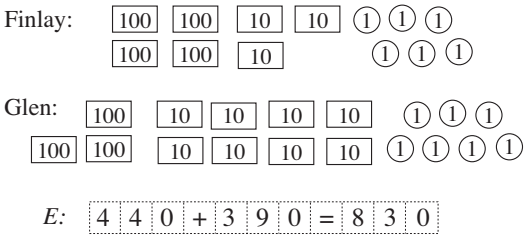
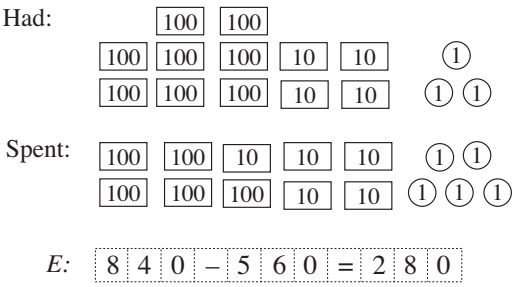
Bk4

R: Calculation

C: Operations with numbers up to 1000. Addition, subtraction

E: Numbers up to 2000

Lesson Plan 5

Activity		*Notes*
1	**Mental practice** T says an addition, P says sum. If a P makes a mistake, the next P must correct it. e.g. 20 + 90 (= 110), 31 + 50 (= 81), 150 + 400 (= 550), 7 + 16 (= 23), 45 + 47 (= 92), 132 + 68 (= 200), 435 + 435 (= 870), etc. *5 min*	Whole class activity In order round class At speed Ps can think of additions too! Praising
2	**Money models** a) Let's calculate how much money these two people have altogether. Ps come to BB to write amounts in the place value table, explaining reasoning. Class agrees/disagrees. What should we do before we start the calculation? (Estimate) Ps estimate the total mentally and come to BB to do the calculation, explaining reasoning in detail. Class agrees/disagrees. BB:  H T U 4 3 6 + 3 8 7 8 2 3 1 1 Horizontal methods: 436 + 387 = 700 + 110 + 13 = 823 or 436 + 387 = 736 + 87 = 816 + 7 = 823 b) Let's calculate how much money Helen had left after she had been shopping. Ps come to BB to write amounts in the place value table, explaining reasoning. Class agrees/disagrees. What should we do before we start the calculation? (Estimate) Ps estimate the total mentally and come to BB to do the calculation, explaining reasoning in detail. Class agrees/disagrees. BB:  H T U 8 $^{10}4$ $^{10}3$ – 5_1 5_1 5 2 8 8 Horizontal method: 843 – 555 = 700 + 130 + 13 – 555 e.g. = 700 – 500 + 130 – 50 + 13 – 5 = 200 + 80 + 8 = 288 or mentally: 843 – 555 = 843 – 543 – 12 = 300 – 12 = 288 *13 min*	Whole class activity Drawn or stuck on BB or use enlarged copy master or OHP (Or T could have 2 purses already prepared and ask 2 Ps to come to front of class, open their purse and stick model money on BB. Names on BB would then be the Ps' names.) Details: e.g. 6U + 7U = 13U = 1T + 3U 3T + 8T + 1T = 12T = 1H + 2T 4H + 3H + 1H = 8H Revision of mental and written procedures Whole class activity Drawn or stuck on BB or use enlarged copy master or OHP (Or use name of a P in class) Accept any correct reasoning e.g. adding same amount to reductant and subtrahend, as in main diagram, or changing 1H to 10T and 1T to 10U: H T U ~~7~~ ^{10}~~3~~ ^{10}3 – 5 5 5 2 8 8 or H T U 7 13 13 – 5 5 5 2 8 8 T stresses preferred method.

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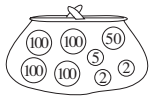
Bk4

Lesson Plan 5

Activity		*Notes*
3	**Problems** Listen carefully, write the data and do the calculations in your *Ex. Bks*. Show me the answer when I say. Ps who respond correctly come to BB to explain reasoning. Who agrees? Who did it another way? Who made a mistake? What kind of mistake? etc.	Individual work in *Ex. Bks* but class kept together, then whole class review Give Ps time to think and do calculations, then responses shown in unison.
	a) *Gina has £2.35 in her piggy bank and £4.59 in her purse. How much money does she have altogether?* BB:  £2.35 = 235 p £4.59 = 459 p + H T U / 2 3 5 / 4 5 9 / 6 9 4 (1) *Answer:* Gina has £6.94 altogether.	Drawn on BB or use enlarged copy master or OHP Reasoning, agreement, self-correction, praising BB: 694 p = £6.94
	b) *How much money would Gina have if her father were to put another £2.00 in her piggy bank?* Show me . . . now! (£8.94)	BB: £6.94 + £2.00 = £8.94 (or £4.35 + £4.59 = £8.94)
	c) *How much money would Gina have if she took £3.00 from her purse and spent it?* Show me . . . now! (£3.94)	BB: £6.94 – £3.00 = £3.94 (or £2.35 + £1.59 = £3.94)
	d) *How much money would Gina have if she took £4.00 out of her purse and put it in ther piggy bank?* Show me . . . now! (£6.94)	There would be no change, as she only moved money from one place to the other.
	21 min	
4	***Book 4, page 5*** Q.1 Read: *Write your estimation in detail. Calculate the exact sum.* Deal with one part at a time. Review at BB with whole class. Ps give details of calculation. Mistakes discussed and corrected. *Solution:* a) **263 + 526** *E:* 300 + 500 = 800, or 260 + 530 = 790 *C:* 263 + 526 = 789 b) **354 + 419** *E:* 400 + 400 = 800, or 350 + 420 = 770 *C:* 354 + 419 = 773 (1) c) **475 + 53 + 419** *E:* 500 + 100 + 400 = 1000, or 480 + 50 + 420 = 950 *C:* 475 + 53 + 419 = 947 (1 1)	Individual work, monitored, helped Written on BB or use enlarged copy master or OHP Reasoning, agreement, self-correction, praising Details: e.g. c) 5U + 3U + 9U = 17U = 1T + 7U 7T + 5T + 1T + 1T = 14T = 1H + 4T 4H + 4H + 1H = 9H Feedback for T
	28 min	

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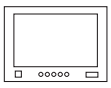
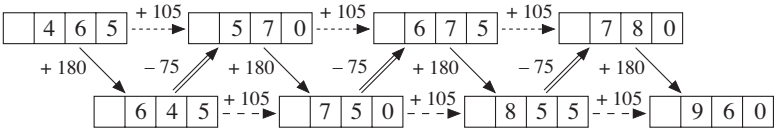
Bk4

Lesson Plan 5

Activity		*Notes*
5	***Book 4, page 5*** Q.2 Read: *How much money do we have left? Estimate, calculate and check the result.* How much money did we have? (£645) How can we check our calculation? (addition and subtraction) Set a time limit. Review at BB with whole class. Ps give details of calculations. Class agrees/disagrees. Mistakes discussed and corrected. *Solution:* £645 We had: 100 100 100 20 (1)(1)(1) / 100 100 100 20 (1)(1) We bought:  £232 *E:* 650 − 230 = 420 *C:* 645 − 232 = 413 *Check:* 413 + 232 = 645, 645 − 413 = 232 ✔ *34 min*	Individual work, monitored, helped Drawn (or stuck) on BB or use enlarged copy master or OHP Reasoning, agreement, self-correction, praising Feedback for T
6	***Book 4, page 5*** Q.3 Read: *What is the difference between 743 and 558? Estimate, calculate and check the result.* What kind of operation is it? (subtraction) How can we check it? (addition and subtraction) Review at BB with whole class. Ps give details of calculations. Who did the same? Who calculated in a different way? Mistakes discussed and corrected. *Solution:* *E:* 700 − 600 = 100 or 740 − 560 = 180 *C:* $7\,{}^{10}4\,{}^{10}3 - 5_1\,5_1\,8 = 185$ *Check:* 185 + 558 = 743, 743 − 185 = 558 e.g. Who could write it as an inequality? Who agrees? etc. *38 min*	Individual work, monitored, helped Written on BB or use enlarged copy master or OHP Reasoning, agreement, self-correction, praising Details: e.g. I cannot subtract 8U from 3U, so I add 10U to reductant and 1T to subtrahend: 10U + 3U = 13U 13U − 8U = 5U, 5T + 1T = 6T, but I cannot subtract 6T from 4T, so I add 10T to reductant and 1H to subtrahend, etc BB: $743 \underset{185}{>} 558$
7	***Book 4, page 5, Q.4*** Read: *Fill in the missing numbers and write above the dotted and dashed arrows what they mean if the solid arrow means + 180 and the double arrow means − 75.* Ps come to BB to write the operations beside the arrows and to fill in the missing numbers. Ps explaining reasoning in detail. Rest of class check that they are correct. *Solution:*  If the arrows pointed in the opposite direction, what would they mean? *45 min*	Whole class activity (or individual work if Ps wish) Drawn on BB or use enlarged copy master or OHP Involve several Ps. At a good pace Ps write solution in *Pbs* too. Agree that both dotted and dashed arrows mean the same (+ 105) so only one arrow is necessary. Agreement, praising

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Bk4	R: Calculation **C: Operations with numbers up to 1000** *E: Operations with numbers up to 2000*	*Lesson Plan* *6*
Activity		***Notes***
1	**Mental practice** T says an operation, Ps say result. a) Addition and subtraction: e.g. 5 + 8, 11 + 7, 38 – 5, 76 + 22, 400 + 500, 680 – 80, 76 + 9, 96 – 7. 42 + 49 (= 42 + 40 + 9 = 82 + 9 = 91), 64 – 38 (= 64 – 30 – 8 = 34 – 8 = 26), etc. b) Multiplication and division: e.g. 3 × 4, 8 × 7, 6 × 9, 7 × 6, 5 × 20, 81 ÷ 9, 42 ÷ 2, 250 ÷ 2, 640 ÷ 80, 50 × 3, 50 × 30, 34 × 10, 450 ÷ 9, etc. *6 min*	Whole class activity At speed round class (or T chooses Ps at random) If a P makes a mistake, the next P corrects it. If problems, write details of calculation on BB. Reasoning, agreement, praising
2	**Secret number 1** I am thinking of a 2-digit number. I will give you clues and you must tell me what number I could be thinking of. 1) *The difference between its digits is 3. What number could I be thinking of?* Ps write possible numbers in *Ex. Bks*. Ps dictate numbers to T. BB: 14, 25, 36, 47, 58, 69, 30, 41, 52, 63, 74, 85, 96 2) *It is also divisible by 6. What number could it be?* Ps show possible numbers on command. BB: 30, 36 or 96 3) *Also, the number in reverse order is divisible by 7.* Show me the number . . .now! (36) [63 is divisible by 7] *10 min*	Whole class activity Give Ps time to think and write. Agreement, praising Responses shown on scrap paper or slates in unison In unison. Praising
3	**Secret number 2** Think of a 1-digit number. Multiply it by 9. If you tell me the units digit of the product, I will tell you the number you first thought of. T asks several Ps for units digits and tells them their original number. e.g. P_1: the units digit of my product is 3. T: your number is 7. P_2: the units digit of my product is 8. T: your number is 2. Who knows how I do it? Ask several Ps what they think. Reason with reference to the 9 times table. e.g 7 × 9 = 6<u>3</u>, 2 × 9 = 1<u>8</u> BB: 0, 9, 18, 27, 36, 45, 54, 63, 72, 81 0 1 2 3 4 5 6 7 8 9 *15 min*	Whole class activity Ps could stand up when they know how it is done. Let them try too before discussing strategy with the class. Reasoning, agreement, praising
4	**Problems** Listen carefully, write the data and do the calculations in your *Ex. Bks*. Show me the answer when I say. (On scrap paper or slates) Ps who respond correctly come to BB to explain reasoning. Who agrees? Who did it another way? Who made a mistake? What kind of mistake? etc. a) *Dan had £925 in his bank account. He bought a computer for £458. How much does he have left in his account?* BB: 925 – 458 = 525 – 58 = 475 – 8 = <u>467</u> or *Answer:* Dan has £467 left. $\begin{array}{\|c\|c\|c\|} \hline 9 & {}^{10}2 & {}^{10}5 \\ \hline - \; 4_1 & 5_1 & 8 \\ \hline 4 & 6 & 7 \\ \hline \end{array}$ Use this result to help you answer the following questions.	Individual work in *Ex. Bks* but class kept together, then whole class review Give Ps time to think and do calculations, then responses shown in unison. Reasoning, agreement, self-correction, praising

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Bk4

Lesson Plan 6

Activity		*Notes*
4	(Continued) b) *How much money would Dan have left if he had £200 less in his account before he bought the computer?* Show me . . . now! (£267) BB: 467 – 200 = 267 or c) *How much money would Dan have left if he had spent £200 less?* Show me . . . now! (£667) BB: 467 + 200 = 667 or d) *How much money would Dan have left if he had £300 more in his account before he bought the computer?* Show me . . . now! (£767) BB: 467 + 300 = 767 or e) *How much money would Dan have left if he had spent £300 more?* Show me . . . now! (£167) BB: 467 – 300 = 167 or f) *How much money would Dan have left if he had £400 more in his account before he bought the computer and the computer cost £400 more?* Show me . . . now! (£467) BB: 467 + 400 – 400 = 467 or or 'If you have £400 more but spend £400 more, the amount left stays the same.'	BB: 725 − 458 = 267 BB: 925 − 258 = 667 BB: 1225 − 458 = 767 BB: 925 − 758 = 167 BB: 1325 − 858 = 467 Extra praise if Ps deduce this without help.
	25 min	
5	***Book 4, page 6*** Q.1 Read: *Practise addition. Estimate the sum first.* Set a time limit. Remind Ps to check their results mentally by adding in opposite direction and also by comparing with estimate. Review at BB with whole class. Ps come to BB or dictate to T, explaining reasoning. Mistakes discussed and corrected. *Solution:* a) 263 + 526, *E:* 800; 263 + 526 = 789 b) 493 + 174, *E:* 700; 493 + 174 = 667 c) 278 + 426, *E:* 700; 278 + 426 = 704	Individual work, monitored (helped) Written on BB or use enlarged copy master or OHP Reasoning, agreement, self-correction, praising **Extension** Think of a subtraction for each addition. T chooses Ps at random. e.g. a) 879 – 523 = 356 Orally at speed
	30 min	
6	***Book 4, page 6*** Q.2 Read: *Practise subtraction. Estimate the difference first. Check your result in two ways.* Set a time limit. Remind Ps to compare results with estimates. Review at BB with whole class. Ps come to BB or dictate to T, explaining reasoning in detail. Mistakes discussed and corrected. *Solution:* a) 978 – 426, *E:* 600, *C:* 552; *Check:* 552 + 426 = 978 ✔; *Check:* 978 – 552 = 426 ✔ b) 803 – 576, *E:* 200, *C:* 227; *Check:* 227 + 576 = 803 ✔; *Check:* 803 – 227 = 576 ✔	Individual work, monitored, helped Written on BB or use enlarged copy master or OHP Differentiation by time limit Reasoning, agreement, self-correction, praising T helps with spoken details of subtraction if necessary.
	35 min	

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Bk4		*Lesson Plan 6*
Activity		***Notes***
7	***Book 4, page 6*** Q.3 Read: *Complete the additions and subtractions.* Set a time limit. Set simpler tasks (without crossing tens) for less able Ps if necessary. Ps check their results by doing the calculations again mentally. Review at BB with whole class. Ps come to BB to do calculations, explaining reasoning in detail. Class agrees/ disagrees. Mistakes discussed and corrected. *Solution:* a) $\begin{array}{r} 638 \\ +\,\mathbf{436} \\ \hline 1074 \end{array}$ b) $\begin{array}{r} \mathbf{348} \\ +\,257 \\ \hline 605 \end{array}$ c) $\begin{array}{r} 915 \\ -\,\mathbf{742} \\ \hline 173 \end{array}$ d) $\begin{array}{r} \mathbf{1140} \\ -\,487 \\ \hline 653 \end{array}$ *40 min*	Individual work, monitored, helped Written on BB or use enlarged copy master or OHP Differentiation by time limit (or by task) Reasoning, agreement, self-correction, praising T helps with details of reasoning where necessary.
8	***Book 4, page 6, Q.4*** Read: *I thought of a number, then added 900.* *The result was a number less than 1000.* T (or P) reads each statement, then Ps show decision on whether true or false by pre-agreed actions (e.g. hands in the air if true or knock on the desk if false) or by writing T or F (or ✔ or ✗) on scrap paper or slates. a) *The number I first thought of must be less than 100.* Show me . . . now! (T) $(100 + 900 = 1000)$ b) *The number I first thought of must be less than 99.* Show me . . . now! (F) $(99 + 900 = 999 < 1000)$ c) *The number I first thought of could be equal to 99.* Show me . . . now! (T) d) *The number I first thought of cannot be more than 99.* Show me . . . now! (T) e) *The number I first thought of could be equal to 10.* Show me . . . now! (T) $(10 + 900 = 910 < 1000)$ f) *The number I first thought of cannot be100.* Show me . . . now! (T) *45 min*	Whole class activity (or individual trial first if Ps wish) Statements written on BB or SB or OHT (or use enlarged copy master) Ps decide on actions, if used. Responses shown in unison on command. Ps give examples or counter examples to support their responses (especially incorrect ones!) In good humour! Discussion, reasoning, agreement (self-correction in *Pb*s if done individually first) Praising, encouragement only Feedback for T

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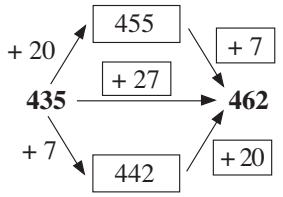
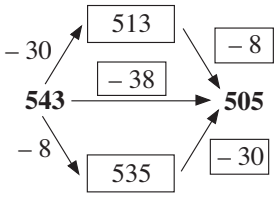
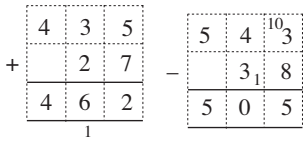
Bk4

R: Mental calculation
C: Operations with numbers up to 1000
E: Numbers up to 2000

Lesson Plan 7

Activity		*Notes*
1	**Missing numbers** Study the diagrams. Let's fill in the missing numbers and signs. Ps come to BB to fill in a box, explaining reasoning. Class agrees/ disagrees. Calculations can be done at side of BB if necessary. BB: a)  b)  [Revision of crossing tens in addition and subtraction] *5 min*	Whole class activity Drawn on BB or use enlarged copy master or OHP At a good pace Reasoning, agreement, praising Calculations, e.g. a) b) 
2	**Competition** T divides class into 2 teams (of roughly equal ability). T gives a number to each team (e.g. 800 and 650) I will give you 3 minutes to write your number in as many different ways as you can. Start . . . now! . . . Stop! Each team checks the other's descriptions. Team with most correct descriptions is the winner! If both the same, T chooses team with the most creative descriptions. e.g. $800 = 135 + 665 = 200 + 600 = 915 - 115 = 400 \times 2 = 1000 - 200 = 1600 \div 2 = 2 \times 2 \times 2 \times 10 \times 10$, etc. $650 = 500 + 150 = 10 \times 65 = 1000 - 350 = 5 \times 130 = 1300 \div 2 = (76 - 1) \times 10 = 12 \times 50 + 200 \div 4$, etc. *10 min*	Whole class activity BB divided into two parts (or numbers written on SBs or large sheets of paper on different walls of clasroom Ps from each team come to BB one after the other. At speed Rest of team check their responses for repeats or incorrect descriptions. Class applauds the winner!
3	**Secret number** I am thinking of a number. Try to find out what it is by asking me questions about it. I can answer only yes or no and your question must be different from the previous one. e.g. • Is it more than 1000? No • Does it have 3 digits? Yes • Is it less than 500? No • Does it have an even digit in the hundreds column? Yes • Is it more than 700? Yes • Is its tens digit less than 5? Yes • Is it less than 820? Yes • Does it have two digits the same? Yes • Is it more than 810? Yes • Is it odd? No • Is it 818? Yes *15 min*	Whole class activity T chooses Ps at random to ask a question. Encourage Ps to ask logical questions and to keep in mind clues already found out from previous questions. Ps can make notes in *Ex. Bks*. At a good pace Extra praise for clever questions Repeat with another number if time (or P comes to front to think of a number and to answer questions.)

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Bk4

Lesson Plan 7

Activity		*Notes*
4	***Book 4, page 7*** Q.1 Read: *The sum of any two adjacent numbers is the number directly above them. Fill in the missing numbers.* Set a time limit. Review at BB with whole class. Ps come to BB to fill in numbers or dictate to T, explaining reasoning. Class agrees/disagrees. Mistakes corrected. *Solution:* a) **1000** 615 **385** **325** 290 95 **90** 235 55 40 b) **2000** 600 1400 **200** **400** 1000 0 **200** 200 **800** *20 min*	Individual work, monitored, helped Drawn on BB or use enlarged copy master or OHP Calculations done in *Ex. Bks* or on slates if necessary. Reasoning, agreement, self-correction, praising At a good pace **Bold** numbers are given.
5	***Book 4, page 7*** Q.2 Read: *Fill in the missing numbers.* Make sure Ps know that equations must be true both horizontally and vertically. Encourage Ps to calculate mentally and to check their results. Set a time limit. Review at BB with whole class. Ps come to BB or dictate to T, explaining reasoning. Mistakes discussed and corrected. *Solution:* a) 30 + 120 + 120 = **270** + + + + 200 + 150 − 130 = **220** + − − − 110 + 30 + 110 = **250** = = = = **340** − **240** + **140** = **240** b) 260 − 120 + 50 = **190** − + + − 110 + 150 − 100 = **160** + − − + 30 + 230 − 40 = **220** = = = = **180** − **40** + **110** = **250** *26 min*	Individual work, monitored, (helped) Written on BB or use enlarged copy master or OHP Differentiation by time limit Discussion, agreement, self-correction, praising Feedback for T
6	***Book 4, page 7*** Q.3 Read: *Do the additions and subtractions. Look for connections between them.* Encourage Ps to do calculations mentally. Set a time limit. Review at BB with whole class. Ps dictate results to T or come to BB. Mistakes discussed and corrected. *Solution:* a) 25 + 40 = 65 725 + 40 = 765 725 + 140 = 865 b) 58 − 40 = 18 658 − 40 = 618 658 − 240 = 418 c) 60 + 17 = 77 60 + 317 = 377 460 + 317 = 777 d) 93 − 63 = 30 393 − 63 = 330 393 − 363 = 30 What did you notice about them? (e.g. if one of the terms is increased by a certain amount, then the sum will also increase by that amount; if the number being subtracted (subtrahend) is increased by a certain amount, then the difference will decrease by that amount, etc.) *32 min*	Individual work, monitored, (helped) Written on BB or use enlarged copy master or OHP Agreement, self-correction, praising Feedback for T Whole class discussion Involve several Ps. Ps come to BB to point and explain. Praise all contributions. T repeats Ps' explanations more clearly if necessary.

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Bk4

Lesson Plan 7

Activity		*Notes*
7	***Book 4, page 7***	Individual work, monitored, helped, but class kept together on questions
	Q.4 Read: *Underline the important data. Write a plan, estimate, calculate and check your result. Write the answer in a sentence. Do the work in your exercise book.*	Discussion, reasoning, agreement, self-correction, praising
	Deal with one part at a time. Set a time limit. Ps read question themselves and solve it in *Ex. Bks*. Make sure that you do not miss a step! Ps sit up with arms folded when finished.	Keep up a good pace throughout
	Review at BB with whole class. Ps come to BB to show solutions, explaining reasoning. Who agrees? Who did it a different way? Who made a mistake? What kind of mistake? etc.	Feedback for T
	Repeat for each of the other questions.	
	Solution:	
	a) *There were 348 boys and 316 girls at a summer camp. How many children were at the camp altogether?*	
	Plan: B + G = 348 + 316 *C:* $\begin{array}{r} 348 \\ +\ 316 \\ \hline 664 \\ {\scriptstyle 1\ \ \ } \end{array}$ *Check:* ↓ ↑	or BB: 348 + 316 = 648 + 16 = 664
	Estimation: 300 + 300 = 600 or 350 + 320 = 670	
	Answer: 664 children were at the camp.	
	b) *417 children were taking part in a concert. If 188 of them were girls, how many boys were there?*	
	Plan: G: 188, B: 417 – 188 *C:* $\begin{array}{r} 4\,{}^{10}1\,{}^{10}7 \\ -\ 1_1\,8_1\,8 \\ \hline 2\,2\,9 \end{array}$	*Check:* e.g. $\begin{array}{r} 229 \\ +\ 188 \\ \hline 417 \\ {\scriptstyle 1\ \ 1\ \ } \end{array}$ ✔ or use subtraction
	Estimation: 400 – 200 = 200 or 420 – 190 = 230	
	Answer: There were 229 boys.	
	c) *In an obstacle race, the number of girls taking part was 43 less than the number of boys. If 227 boys took part, how many girls were in the race?*	or G < B (43)
	Plan: B: 227, G: 227 – 43 *C:* $\begin{array}{r} 227 \\ -\ 43 \\ \hline 184 \end{array}$	*Check:* e.g. $\begin{array}{r} 184 \\ +\ 43 \\ \hline 227 \\ {\scriptstyle 1\ \ \ } \end{array}$ ✔ or use subtraction
	Estimation: 230 – 40 = 190	
	Answer: There were 184 girls in the race.	
	d) *234 girls took part in a treasure hunt. Eve came second. The number of girls taking part was 109 less than the number of boys.*	Agree that Eve coming second is not important.
	How many boys took part? How many children took part altogether?	
	i) *Plan:* G: 234, B: 234 + 109 *C:* $\begin{array}{r} 234 \\ +\ 109 \\ \hline 343 \\ {\scriptstyle 1\ \ \ } \end{array}$	or G < B (109)
	Estimation: 230 + 110 = 340	Check by adding in opposite direction.
	Answer: There were 343 boys.	
	ii) *Plan:* G + B: 234 + 343 *C:* $\begin{array}{r} 234 \\ +\ 343 \\ \hline 577 \end{array}$	or $\begin{array}{r} 234 \\ 234 \\ +\ 109 \\ \hline 577 \\ {\scriptstyle 1\ \ \ } \end{array}$
	Estimation: 230 + 340 = 570	
	Answer: 577 children took part.	

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Bk4		*Lesson Plan 7*
Activity		***Notes***
7	(Continued) e) *One morning there were <u>664 children</u> on the beach.* *<u>385</u> of them went home for lunch.* *How many children remained on the beach?* *Plan:* Were: 664 children Went home: 385 children Children remaining: 664 – 385 *Estimation*: 700 – 400 = 300 or 660 – 390 = 260 + 10 = 270 *Answer:* 279 children remained on the beach. *C:* $\begin{array}{r\|c\|c\|c\|} & & {}^{10} & {}^{10} \\ & 6 & 6 & 4 \\ \hline - & 3_1 & 8_1 & 5 \\ \hline & 2 & 7 & 9 \\ \hline \end{array}$ Stand up if you had all 5 problems correct. Let's give them a round of applause! *45 min*	*Check:* e.g. $\begin{array}{r\|c\|c\|c\|} & 2 & 7 & 9 \\ + & 3 & 8 & 5 \\ \hline & 6 & 6 & 4 \\ \hline & {}_1 & {}_1 & \end{array}$ ✔ or use subtraction Stars, stickers, etc. awarded

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Bk4

R: Mental calculation

C: Operations up to 1000. Multipication/division tables

E: Numbers up to 2000

Lesson Plan 8

Activity		*Notes*
1	**Multiplication practice** Let's practise the multiplication table. Ps say whole equation. 1 × 0 = 0, 1 × 1 = 1, 1 × 2 = 2, . . . 1 × 10 = 10, (1 × 11, . . .) 2 × 0 = 0, 2 × 1 = 2, 2 × 2 = 4, . . . 2 × 10 = 20, (2 × 11, . . .) 3 × 0 = 0, 3 × 1 = 3, 3 × 2 = 6, . . . 3 × 10 = 30, (3 × 11, . . .) . . . 10 × 0 = 0, 10 × 1 = 10, 10 × 2 = 20, . . . 10 × 10 = 10 (1 0 × 11, . . .) *5 min*	Whole class activity Some in unison, some in order round class, some where T chooses Ps at random At speed. Praising Less able Ps may use printed tables.
2	**Division practice** Let's practise the division table. T says a division, Ps say quotient. 0 ÷ 0 (impossible), 1 ÷ 0 (impossible), 7 ÷ 0 (impossible) 0 ÷ 1 = 0, 1 ÷ 1 = 1, 2 ÷ 1 = 2, . . . 10 ÷ 1 = 10, (157 ÷ 1 = 157) 0 ÷ 2 = 0, 2 ÷ 2 = 1, 4 ÷ 2 = 2, 6 ÷ 2 = 3, 8 ÷ 2 = 4, 10 ÷ 2 = 5, . . . 20 ÷ 2 = 10, (68 ÷ 2 = 34, 1 ÷ 2 = $\frac{1}{2}$, 7 ÷ 2 = $3\frac{1}{2}$) 0 ÷ 3 = 0, 3 ÷ 3 = 1, 6 ÷ 3 = 3, 9 ÷ 3 = 3, . . . 30 ÷ 3 = 10, (33 ÷ 3 = 11, 36 ÷ = 12, 150 ÷ 3 = 50, 960 ÷ 3 = 320, 2 ÷ 3 = $\frac{2}{3}$, 50 ÷ 3 = 48 ÷ 3 + 2 ÷ 3 = 16 + $\frac{2}{3}$ = $16\frac{2}{3}$) . . . 0 ÷ 10 = 0, 10 ÷ 10 = 1, 20 ÷ 10 = 2, . . ., 100 ÷ 10 = 10, (1500 ÷ 10 = 150, 1320 ÷ 10 = 132, 672 ÷ 10 = 67 + $\frac{2}{10}$ = $67\frac{2}{10}$ = 67.2) *10 min*	Whole class activity T chooses Ps at random. Class points out errors. At speed Divisions in brackets are to see what Ps can do and to extend more able Ps. Write on BB if there are problems, especially divisions resulting in fractions. T helps Ps with explanations but stress that Ps will learn it in a later lesson. Praising, encouragement only
3	**Order of operations** Let's see how clever you are at doing calculations! Ps come to BB to do calculations in correct order, explaining reasoning in detail. Other Ps point out errors or suggest easier ways of calculating. BB: a) 89 + 45 – 28 = (106) 89 + (45 – 28) = (106) (89 + 45) – 28 = (106) b) 197 – 54 + 28 = (171) 197 – (54 + 28) = (115) (197 – 54) + 28 = (171) c) 360 ÷ 4 × 2 = (180) 360 ÷ (4 × 2) = (45) (360 ÷ 4) × 2 = (180) d) 120 × 8 ÷ 4 = (240) 120 × (8 ÷ 4) = (240) (120 × 8) ÷ 4 = (240) *20 min*	Whole class activiry Written on BB or use enlarged copy master or OHP Discussion, reasoning, agreement, praising Calculations done at side of BB if necessary. BB: details, e.g. 89 + 45 = 90 + 44 = 134 360 ÷ 8 = 90 ÷ 2 = <u>45</u> 120 × 8 = 100 × 8 + 20 × 8 = 800 + 160 = <u>960</u>
4	***Book 4, page 8*** Q.1 Read: *Complete the table using the rule given.* Set a time limit. Encourage mental calculation. Review at BB with whole class. Ps come to BB or dictate to T, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected. *Solution:* *25 min*	Individual work, monitored, helped Drawn on BB or use enlarged copy master or OHP Differentiation by time limit Calcualtions may be done in *Ex. Bks* if necessary Reasoning, agreement, self-correction, praising

a	648	563	437	343	847	358	1345	**734**
b	342	204	548	285	51	**561**	**284**	814
a + b	**990**	**767**	**985**	**628**	**898**	919	1629	1548

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Bk4

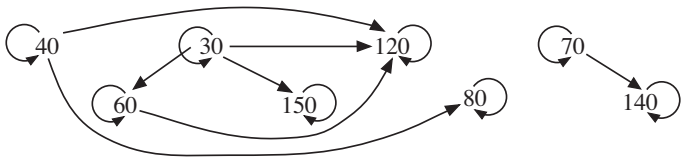
Lesson Plan 8

Activity		*Notes*
5	***Book 4, page 8*** Q.2 Read: *Complete the table using the rule given.* Set a time limit. Calculations written in *Ex. Bks.* if necessary. Review at BB with whole class. Ps come to BB or dictate to T, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected. *Solution:*	Individual work, monitored, helped Drawn on BB or use enlarged copy master or OHP Differentiation by time limit Encourage Ps to do easy calculations mentally. Reasoning, agreement, self-correction, praising **Extension** Ps add other columns to table.

x	674	452	548	343	847	919	1629	**1548**
y	261	309	437	285	51	**561**	**1345**	734
$x - y$	**413**	**143**	**111**	**58**	**796**	358	284	814

30 min

6	***Book 4, page 8*** Q.3 Read: *Draw arrows pointing towards the multiples.* Tell me a multiple of 3 (5, 8, 10, 100). Elicit that a multiple of a number is exactly divisible by that number, or is the result of multiplying that number by another number. What has 30 been multiplied by to result in 60? ($30 \times \underline{2} = 60$) Ps draw arrows in *Pbs*. Review at BB with whole class. Ps come to BB draw arrows or dictate where T should draw them. Class agrees/disagrees. Mistakes corrected. *Solution:*	Individual work, monitored, helped Written on BB or use enlarged copy master or OHP Revision of what a multiple is. Ps tell what they know. T repeats clearly if necessary. Discussion, reasoning, agreement, self-correction praising



	Ps might not have shown that 40 is a multiple of 40, etc. Remind Ps that, e.g. the multiples of 3 are: 0, 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, . . . because 0 times and 1 times a number result in the multiples 0 and the number itself, i.e. $0 \times 3 = \underline{0}$ and $1 \times 3 = \underline{3}$.	Whole class discussion BB: Multiples of a natural number always include 0 and the number itself.
Extension	If the arrows pointed in the opposite direction, what would they show? (They would point towards a factor of the number.) e.g. 30 is a factor of 60 because $\underline{30} \times 2 = 60$. Elicit that a factor of a certain number divides into that number exactly, or multiplies another number to make that certain number. What other numbers are factors of 60? (3×20, 5×12, 6×10, 4×15, 60×1) Is 0 a factor of 60? (No, because it is impossible to divide by 0, or because $0 \times$ another number $\neq 60$. 0 can only be a multiple of 60: $0 \times 60 = \underline{0}$) What special name do we give natural numbers which have only 1 and the number itself as factors? (prime numbers) Who can tell me a prime number? T writes what Ps dictate. Class agrees/disagrees.	Whole class discussion Allow Ps to tell what they know. T repeats more clearly if necessary. BB: Factors of a natural number always include 1 and the number itself, but never 0! BB: Prime numbers e.g. 1, 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, . . . Agreement, praising

35 min

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Bk4

Lesson Plan 8

Activity		*Notes*
7	***Book 4, page 8***	Individual work, monitored, helped. Class kept together for a) and b), then differentiation by time limit.
	Q.4 Read: *Underline the important data. Write a plan, estimate, calculate and check your result. Write the answer in a sentence. Do the work in your exercise book.*	Only the most able Ps will have time to finish all the questions individually. If no P finishes in the set time, e) can be done at home if Ps wish and reviewed in *Lesson 9,* or done with the whole class.
	Deal with one part at a time. Set a time limit. Ps read question themselves and solve it in *Ex. Bks*. Make sure that you do not miss a step! Ps sit up with arms folded when finished.	Discussion, reasoning, agreement, self-correction, praising
	Review with the whole class. Ps come to BB to show solutions, explaining reasoning. Who agrees? Who did it a different way? Who made a mistake? What kind of mistake? etc.	Keep up a good pace throughout.
	Repeat for each of the other questions.	
	Solution:	
	a) *Ann has £716 and Barry has £285 less. How much money does Barry have? How much money do Ann and Barry have altogether?*	
	i) *Plan:* A: £716, B: £716 – £285 *C:*	Check with addition or subtraction
	Estimation: e.g. 700 – 300 = 400	
	Answer: Barry has £431.	
	ii) *Plan:* A + B: £716 + £431 *C:*	or 716 × 2 – 285 = 1432 – 285
	Estimation: e.g. 720 + 430 = 1150	
	Answer: Ann and Barry have £1147 altogether.	
	b) *Ann has £716 and Sarah has £285 more. How much money does Sarah have? How much money do Ann and Sarah have altogether?*	
	i) *Plan:* A: £716, S: £716 + £285 *C:*	Check with addition in opposite direction
	Estimation: e.g. 700 + 300 = 1000	
	Answer: Sarah has £1001.	
	ii) *Plan:* A + S: £716 + £1001 *C:*	or 716 × 2 + 285
	Estimation: e.g. 720 + 1000 = 1720	
	Answer: Ann and Sarah have £1717 altogether.	
	c) *Ann has £716, which is £285 less than Tom has. How much does Tom have? How much do Ann and Tom have altogether?*	Extra praise if Ps notice similarity to b)
	i) *Plan:* A: £716, T: £716 + £285 = £1001 (from b))	
	Answer: Tom has £1001.	
	ii) *Plan:* A + T: £716 + £1001 = £1717 (from b))	
	Answer: Ann and Tom have £1717 altogether.	
	d) *Ann has £716, which is £285 more than Suzy has. How much does Suzy have? How much do Ann and Suzy have altogether?*	Extra praise if Ps notice similarity to a)
	i) *Plan:* A: £716, S: £716 – £285 = £431 (from a))	
	Answer: Suzy has £431.	
	ii) *Plan:* A + S: £716 + £431 = £1147 (from a))	
	Answer: Ann and Suzy have £1147 altogether.	

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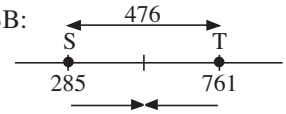
Bk4

Lesson Plan 8

Activity		*Notes*
7	(Continued) e) *Ted has £761 and Sam has £285. How much money should Ted give to Sam so that they both have the same amount?* *Plan:* T: £761, S: £285 Difference: £761 – £285 The point where they both have the same amount will be half way between 761 and 285. (Show on a diagram on BB.) Mid-point: (761 – 285) ÷ 2 = 476 ÷ 2 = 238 *C:* Details: 476 ÷ 2 = 400 ÷ 2 + 60 ÷ 2 + 16 ÷ 2 = 200 + 30 + 8 = 238 *Answer:* Ted should give £238 to Sam and they will both have £523. Stand up if you had all 5 problems correct. (Much deserved applause!)	Individual work, reviewed with whole class, or done as whole class activity Allow Ps to explain solution, with hints from T if necessary. BB:  *Sam* *Ted* *Check:* 285 + 238 = 523 ✔ Reasoning, agreement, self-correction, praising
	41 min	
8	***Book 4, page 8*** Q.5 Read: *Fill in the missing digits.* Set a time limit. Ps check by doing calculation again mentally. Review at BB with whole class. Ps come to BB, explaining reasoning in detail. Class agrees/disagrees. Mistakes discussed and corrected. *Solution:* a) 143 + 609 = 752 b) 156 + 867 = 1023 c) 973 – 561 = 412 d) 807 – 534 = 273	Individual work, monitored, helped (or whole class activity if time is short, or could be set for homework and reviewed in *Lesson 9*) Written on BB or use enlarged copy master or OHP Reasoning, agreement, self-correction, praising
	45 min	

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Bk4	R: Mental and written calculation **C: Multiplication and division tables** *E: Numbers up to 2000*	*Lesson Plan* *9*
Activity		***Notes***
1	**Sequences** T says the first few terms of a sequence and Ps continue it. What is the rule? a) 0, 7, 14, (21, 28, 35, 42, 49, 56, 63, 70, 77, 84, . . .) *Rule:* + 7 (or multiples of 7 in increasing order) b) 0, – 4, 4, – 8, 8, – 12, 12, (– 16, 16, – 20, 20, – 24, 24, . . .) *Rule:* Negative, then corresponding positive, multiples of 4. c) . . ., – 24, – 16, – 8, 0, 8, 16, (24, 32, 40, 48, 56, 64, 72, . . .) *Rule:* + 8 (or whole multiples of 8 in increasing order) d) 11, 22, 33, (44, 55, 66, 77, 88, 99, 110, 121, 132, 143, . . .) *Rule:* + 11 (or natural multiples of 11 in increasing order) *6 min*	Whole class activity At speed in order round class Discussion on the rule. Talk about the different kinds of numbers: *Natural numbers*: positive whole numbers (1, 2, 3, . . .) *Negative numbers*: $n < 0$ *Positive numbers*: $n > 0$ *Fraction*: part of 1 unit Praising, encouragement only
2	**Multiplication table relay** T says a multiplication, e.g. '3 × 4', P_1 says result ('= 12'), then says a multiplication for P_2, e.g.' 7 × 6'; P_2 says result ('= 42'), then says a multiplication for P_3, e.g. '5 × 9', P_3 says result (= 45), etc. Ps may have multiplication table on desks if they wish. T notes the Ps who use it. Class points out errors if next P misses it. *11 min*	Whole class activity At speed in order round class If a P makes a mistake, next P corrects it quickly and says the next multiplication. In good humour!
3	**Division table relay** T says a division, e.g. '8 ÷ 4', P_1 says result ('= 2'), then says a division for P_2, e.g.' 15 ÷ 5'; P_2 says result ('= 3'), then says a division for P_3, e.g. '28 ÷ 7', P_3 says result (= 4), etc. If there is a remainder, Ps must solve it but T states that it was not a correct question. Class points out errors if next P misses it. *17 min*	Whole class activity At speed in order round class If a P makes a mistake, next P corrects it quickly and says the next division. In good humour!
4	**Writing operations** Study the diagrams. Who can write additions or multiplications or divisions about them? Ps come to BB or dictate what T should write. BB: a) 100 100 100 100 / 100 100 100 100 / 100 100 100 100 b) 50 50 50 50 50 / 50 50 50 50 50 / 50 50 50 50 50 / 50 50 50 50 50 e.g. 400 + 400 + 400 = 1200 300 + 300 + 300 + 300 = 1200 600 + 600 = 1200 etc. 400 × 3 = 1200 300 × 4 = 1200 600 × 2 = 1200 etc. 1200 ÷ 100 = 12 1200 ÷ 200 = 6 1200 ÷ 300 = 4 etc. e.g. 250 + 250 + 250 + 250 = 1000 200 + 200 + 200 + 200 + 200 = 1000 500 + 500 = 1000 etc. 250 × 4 = 1000 200 × 5 = 1000 500 × 2 = 1000 etc. 1000 ÷ 50 = 20 1000 ÷ 100 = 10 1000 ÷ 200 = 5 etc. *23 min*	Whole class activity Model money stuck or drawn on BB or use enlarged copy master or OHP At a good pace Agreement, praising Extra praise for unexpected operations, e.g. 50 × 10 × 2 = 1000

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Bk4		*Lesson Plan 9*
Activity		***Notes***
5	***Book 4, page 9*** Q.1 Read: *Calculate the products. Look for relationships.* Set a time limit. Encourage mental calculation. Review at BB with whole class. Ps dictate results to T. Class agrees/disagrees. Mistakes discussed and corrected. *Solution:* a) $4 \times 5 = \underline{20}$ $40 \times 5 = \underline{200}$ $4 \times 50 = \underline{200}$ $4 \times 500 = \underline{2000}$ $40 \times 50 = \underline{2000}$ b) $3 \times 6 = \underline{18}$ $30 \times 6 = \underline{180}$ $3 \times 60 = \underline{180}$ $3 \times 600 = \underline{1800}$ $30 \times 60 = \underline{1800}$ c) $4 \times 4 = \underline{16}$ $40 \times 4 = \underline{160}$ $4 \times 40 = \underline{160}$ $4 \times 400 = \underline{1600}$ $40 \times 40 = \underline{1600}$ Ps tell class what relationships they noticed. (e.g. if one of the factors increases by 10 times, the product increases by 10 times; if both factors increase by 10 times, the product increases by $10 \times 10 = 100$ times, etc.)	Individual work, monitored, helped Written on BB or SB or OHT (or T has BB already prepared and uncovers results as they are dealt with) Reasoning, agreement, self-correction, praising Feedback for T Involve several Ps. T repeats Ps' reasoning in a clearer way if necessary. Praise all contributions.
	27 min	
6	***Book 4, page 9*** Q.2 Read: *Calculate the quotients. Look for relationships.* Set a time limit. Encourage mental calculation. Review at BB with whole class. Ps dictate results to T. Class agrees/disagrees. Mistakes discussed and corrected. *Solution:* a) $12 \div 4 = \underline{3}$ $120 \div 40 = \underline{3}$ $120 \div 4 = \underline{30}$ $1200 \div 40 = \underline{30}$ $1200 \div 4 = \underline{300}$ $1200 \div 400 = \underline{3}$ b) $20 \div 5 = \underline{4}$ $200 \div 5 = \underline{40}$ $200 \div 5 = \underline{40}$ $2000 \div 50 = \underline{40}$ $2000 \div 5 = \underline{400}$ $2000 \div 500 = \underline{4}$ Ps tell class what relationships they noticed. (e.g. if the dividend increases by 10 times, the quotient also increases by 10 times; if the divisor increases by 10 times, the quotient decreases by 1 tenth, etc.)	Individual work, monitored, helped Written on BB or SB or OHT (or T has BB already prepared and uncovers results as they are dealt with) Reasoning, agreement, self-correction, praising Feedback for T Involve several Ps. T repeats Ps' reasoning in a clearer way if necessary. Praise all contributions.
	32 min	
7	***Book 4, page 9*** Q.3 Read: *Calculate the products. Look for relationships.* Set a time limit. Ps can write calculations in *Ex. Bks* if necessary. Review at BB with whole class. Ps come to BB to write results, explaiing reasoning. Class agrees/disagrees. Mistakes discussed and corrected. *Solution:* a) $3 \times 100 = \underline{300}$ b) $100 \times 7 = \underline{700}$ c) $200 \times 4 = \underline{800}$ $3 \times 40 = \underline{120}$ $30 \times 7 = \underline{210}$ $80 \times 4 = \underline{320}$ $3 \times 140 = \underline{420}$ $130 \times 7 = \underline{910}$ $\underline{280} \times 4 = \underline{1120}$ Use this idea to help you do some of the next multiplications.	Individual work, monitored, helped Written on BB or SB or OHT Do parts a), b) and c), then review before doing parts d), e) and f) Reasoning, agreement, self-correction, praising Ps relate what they notice. (Bottom row is the sum of the other two rows)

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Bk4		*Lesson Plan 9*
Activity		***Notes***
7	(Continued) d) $3 \times 12 = \underline{36}$ e) $6 \times 13 = \underline{78}$ f) $7 \times 14 = \underline{98}$ $3 \times 120 = \underline{360}$ $6 \times 130 = \underline{780}$ $7 \times 140 = \underline{980}$ $30 \times 12 = \underline{360}$ $60 \times 13 = \underline{780}$ $70 \times 14 = \underline{980}$ Ps tell what they notice. (e.g. $60 \times 13 = 6 \times 130$, etc.) *37 min*	If problems, write details on BB, e.g. $6 \times 13 = 6 \times 10 + 6 \times 3 = 60 + 18 = \underline{78}$ $7 \times 140 = 7 \times 100 + 7 \times 40 = 700 + 280 = \underline{980}$
8	***Book 4, page 9*** Q.4 Read: *Underline the data. Write a plan. Estimate, calculate and check your result in your exercise book. Write the answer as a sentence.* Set a time limit. Ps read questions themselves, write plans and solve them in *Ex. Bks*, then write the answers as sentences in *Pbs*. Review at BB with whole class. Ps come to BB to show solutions, explaining reasoning. Who agrees? Who did it a different way? Who made a mistake? What kind of mistake? etc. *Solution:* a) *A box of apples weighs about 28 kg. How much do 30 boxes of apples weigh?* *Plan:* 1 box: 28 kg, 30 boxes: 30×28 kg *Estimation*: e.g. 30×30 kg $= 900$ kg *C:* $30 \times 28 = 30 \times 20 + 30 \times 8 = 600 + 240 = \underline{840}$ (kg) *Answer:* 30 boxes of apples weigh 840 kg. b) *How much is the cost of 8 kg of pears if 1 kg costs £1.90?* *Plan:* 1 kg: £1.90 = 190 p, 8 kg: 8×190 p *Estimation*: e.g. 8×200 p $= 1600$ p *C:* $8 \times 190 = 8 \times 100 + 8 \times 90 = 800 + 720 = \underline{1520}$ (p) 1520 p = £15 20 p = £15.20 *Answer:* 8 kg of pears cost £15.20. *42 min*	Individual work, monitored, helped Discussion, reasoning, agreement, self-correction, praising Accept any correct method. e.g. a) $30 \times 28 = 3 \times 10 \times 28 = 3 \times 280 = 600 + 240 = \underline{840}$ b) $8 \times 190 = 8 \times 200 - 8 \times 10 = 1600 - 80 = \underline{1520}$ Feedback for T
9	***Book 4, page 9, Q.5*** Read: *Write a plan for each question.* Deal with one part at a time. Set a time limit. Ps read question themselves, write their plan on slates or scrap paper and show on command. P who wrote correct plan explains to those who did not. Let's solve it. Ps come to BB or dictate what T should write. *Solution:* a) *6 children collected 120 kg of chestnuts. They share them equally. How many kg of chestnuts does each child get?* Show me . . . now! 120 kg ÷ 6 (= <u>20 kg</u>) *Answer:* Each child gets 20 kg of chestnuts. b) *At the market, they are packing fruit into boxes, 30 kg per box. They have 900 kg of fruit. How many boxes will they need?* Show me . . . now! 900 kg ÷ 30 kg (= <u>30</u>) *Answer:* They will need 30 boxes. *45 min*	Individual work in writing plans, but reviewed with whole class. Reasoning, agreement, self-correction in *Pbs*, praising Elicit that 120 kg is divided into 6 <u>equal</u> parts and that each child will get 1 sixth. It can be thought of as: 'How many 30 kg are in 900 kg? or 'How many times does 30 kg go into 900 kg?'

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Bk4	R: Mental calculation. Multiplication and division tables **C: Multiplication, division. Addition, subtraction up to 1000** *E: Up to 2000*	*Lesson Plan* *10*
Activity		***Notes***
1	***Book 4, page 10*** Q.1 Read: *Fill in the numbers which are missing from the multiplication table.* Set a time limit. Less able Ps may have printed tables to help them. Review at BB with whole class. Ps dictate what T should write. Class agrees/disagrees. Mistakes corrected.	Individual work, monitored Drawn on BB or use enlarged copy master or OHP Agreement, self-correction, praising if no mistakes
Extension	Find these sequences in the table and continue them. What is the rule? Who agrees? Who thinks something else? a) 0, 8, 18, 30, (44, 60, 78, 98, 120, . . .) 8, 10, 12, 14, 16, 18, 20, 22 , 24, . . . *Rule:* Difference starts at 8 and increases by 2 (or 0 × 7, 1 × 8, 2 × 9, 3 × 10, 4 × 11, 5 × 12, . . .) b) 0, 5, 12, 21, 32, (45, 60, 77, 96, 117, . . .) 5, 7, 9, 11, 13, 15, 17, 19 , 21, . . . *Rule:* Difference starts at 5 and increases by 2 (or 0 × 4, 1 × 5, 2 × 6, 3 × 7, 4 × 8, 5 × 9, 6 × 10, . . .) c) 0, 2, 6, 12, 20, 30, (42, 56, 72, 90, 110, 132, . . .) 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, . . . *Rule:* Difference starts at 2 and increases by 2 (or 0 × 1, 1 × 2, 2 × 3, 3 × 4, 4 × 4, 5 × 6, 6 × 7, . . .) d) 0, 1, 4, 9, 16, (25, 36, 49, 64, 81, 100, 121, 144, . . .) 1, 3, 5, 7, 9, 11, 13, 15 , 17, 19, 21, 23, . . . *Rule:* Difference starts at 1 and increases by 2 (or 0 × 0, 1 × 1, 2 × 2, 3 × 3, 4 × 4, 5 × 5, 6 × 6, . . .)	Feedback for T T says first few terms, also writing them on the BB. Ps continue sequence in order round class (or T chooses Ps at random). Ps come to multiplication table on BB or OHT to point to terms. Discussion on the rule. T writes differences below terms on BB. Agreement, praising d) Elicit or remind Ps that these numbers are <u>square numbers</u> i.e. they can form a square, e.g. 3 □ (3)
	10 min	
2	**Order of operations** Copy these operations in your *Ex. Bks* and do them in the correct order BB: a) $6 \times 30 + 40 = (220)$ (180) b) $3 \times 60 - 40 = (140)$ (180) c) $60 \times 2 - 25 = (95)$ (120) d) $70 + 80 \div 4 = (90)$ (20) e) $90 + 150 \div 3 = (140)$ (50) f) $200 - 300 \div 6 = (150)$ (50) Set a time limit. Review at BB with whole class. Mistakes discussed and corrected. Revise order of operations if necessary.	Individual work, monitored Written on BB or SB or OHT Ps come to BB to write result of operation to be done first, then to write the answer, explaining reasoning. Class agrees/disagrees. Reasoning, agreement, self-correction, praising Feedback for T
	15 min	

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Bk4

Lesson Plan 10

Activity		*Notes*
3	**Missing numbers** Who can fill in the missing numbers? Ps come to BB to write and explain reasoning with inverse operation. e.g. '7 times 6 = 42, because 42 divided by 6 = 7'. BB: a) **0** × 5 = 0 b) 10 × **7** = 70 c) **7** × 6 = 42 d) 7 × **8** = 56 e) **8** × 1 = 8 f) **1** × 9 = 9 g) **7** × 7 = 49 h) 9 × **8** = 72 i) 18 ÷ **3** = 6 j) **35** ÷ 5 = 7 k) 25 ÷ **5** = 5 l) **0** ÷ 8 = 0 m) **54** ÷ 9 = 6 n) 48 ÷ **8** = 6 o) **27** ÷ 9 = 3 p) ☒ ÷ 0 ≠ 5 *20 min*	Whole class activity Written on BB or use enlarged copy master or OHP At a good pace Reasoning, agreement, praising Agree that it is impossible to divide any number by zero.
4	**Division practice** Let's do these divisions. Ps come to BB in pairs, one P to write quotients and remainders and the other to check with multiplication and addition. Class points out errors. BB: a) 17 ÷ 4 = (4, r 1) [4 × 4 + 1 = 17] ✔ b) 23 ÷ 2 = (11, r 1) [2 × 11 + 1 = 23] ✔ c) 23 ÷ 5 = (4, r 3) [4 × 5 + 3 = 23] ✔ d) 27 ÷ 7 = (3, r 6) [3 × 7 + 6 = 27] ✔ e) 40 ÷ 6 = (6, r 4) [6 × 6 + 4 = 40] ✔ f) 28 ÷ 2 = (14) (no remainder) [14 × 2 = 28] ✔ g) 85 ÷ 5 = (17) (no remainder) [17 × 5 = 85] ✔ h) 75 ÷ 9 = (8, r 3) [8 × 9 + 3 = 75] ✔ *25 min*	Whole class activity (or individual work in *Ex. Bks* if Ps wish) Written on BB or SB or OHT At a good pace Reasoning, agreement, checking, praising Details written on BB if problems, e.g. 85 ÷ 5 = 50 ÷ 5 + 35 ÷ 5 = 10 + 7 = 17 Feedback for T
5	***Book 4, page 10*** Q.2 Read: *Do the calculations in the correct order.* Set a time limit. Ps write result above the first calculation to be done or keep it in mind before writing final result. Review at BB with whole class. Ps come to BB or dictate to T. Mistakes discussed and corrected. What did you notice? e.g. (60 + 20) × 2 = 60 × 2 + 20 × 2 *Solution:* a) $60 + 20^{40} \times 2 = 100$ $(60 + 20)^{80} \times 2 = 160$ * $60 \times 2 + 20^{120} = 140$ $60 \times 2 + 20^{40} \times 2^{120} = 160$ * b) $15 + 30^{10} \div 3 = 25$ $(15 + 30)^{45} \div 3 = 15$ * $15 \div 3 + 30^{5} = 35$ $15 \div 3 + 30^{5} \div 3^{10} = 15$ * *30 min*	Individual work, monitored, helped Written on BB or SB or OHT Reasoning, agreement, self-correction, praising. Extra praise if Ps notice and explain equal results without help from T.

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Bk4

Lesson Plan 10

Activity 6

Book 4, page 10

Q.3 Read: *Complete the tables. Write the rules in different ways.*

Deal with one part at a time. Elicit one form of the rule in words with the whole class first (unless Ps prefer to work it out for themselves). Then Ps complete the table and write the rule in different ways in *Pbs* under a time limit. Ps can do any necessary calculations in *Ex. Bks* or on scrap paper.

Review at BB with whole class. Ps come to BB to fill in columns, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected.

A, come and write the rule. Who agrees? Who can write it another way? Ps check the different forms with values from table.

Solution:

a)

a	4	150	632	111	**604**	354	**704**	635	246	**362**
b	354	500	982	**461**	954	**704**	1054	**985**	**596**	712

$a = b - 350$, $b = a + 350$ Ext: $b - a = 350$, $(a - b = -350)$

b)

x	20	15	200	111	**50**	180	**150**	99	120	**100**
y	140	105	1400	**777**	350	**1260**	1050	**693**	**840**	700

$x = y \div 7$, $y = x \times 7$, Ext: $y \div x = 7$, $(x \div y = \frac{1}{7})$

c)

u	888	346	1	551	**581**	500	**968**	273	**340**	1001
v	112	654	999	**449**	419	**500**	32	**727**	660	**−1**

$u = 1000 - v$, $v = 1000 - u$, $(u + v = 1000)$

d)

m	2	40	10	**800**	200	**5**	8	**50**	25	800
n	400	20	80	1	**4**	160	**100**	16	**32**	**1**

$m = 800 \div n$, $n = 800 \div m$, $(m \times n = 800)$

If any Ps try long division by 2-digit numbers, T helps and asks them to show it on BB. e.g.

```
      3  2
   ------
2  5 | 8  0  0
     -  7  5
   ------
        5  0
     -  5  0
   ------
           0
```

45 min

Notes

Individual work, monitored, (helped)

Tables drawn on BB or use enlarged copy master or OHP

Differentiation by time limit

Reasoning, agreement, self-correcting, praising

At a good pace

If problems, write details of calculations on BB. Accept any correct reasoning, e.g.

BB:

```
    7  10 1  2
  - 3  1  5  0
   ------------
    3  6  2
```

$180 \times 7 = 700 + 560 = \underline{1260}$

$15 \times 7 = 105$, so
$150 \times 7 = \underline{1050}$

$99 \times 7 = 100 \times 7 - 1 \times 7$
$= 700 - 7 = \underline{693}$

$10 \times 80 = 800$, so
$\underline{5} \times 160 = 800$

$5 \times 160 = 800$, so
$\underline{50} \times 16 = 800$

$50 \times 16 = 800$, so

$25 \times \underline{32} = 800$, etc.

Extra praise if Ps notice these easy ways to calculate.

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Bk4	R: Mental calculation **C: Multiplication and division tables. Operations up to 1000** *E: Operations up to 2000*	*Lesson Plan* *11*
Activity		***Notes***
1	**Multiplication table practice** T says a multiplication and: a) chooses Ps at random to answer, b) Ps answer in order round class, c) T says a multiplication, P answers it and says a multiplication for next P to answer, etc. (relay round class) *5 min*	Whole class activity At speed T notes Ps who need to use their own × tables or to look at the × table on classroom wall. Praising, encouragement only
2	**Chain calculations** Listen to my instructions. Do the calculations in your head and write the results of each step one below the other in your *Ex. Bks*. Nod your head when you have done each step. Show me the final result when I say. e.g. *Start with 800. Find its quarter. . . . Add 10. . . . Multiply by 3. . . . Add 70. . . . Divide by 7.* Show me your answer . . . now! (100) Let's write the operations on the BB. Ps come to BB or dictate to T. BB: $800 \div 4 = 200$; $200 + 10 = 210$; $210 \times 3 = 630$; $630 + 70 = 700$; $700 \div 7 = \underline{100}$ How could we write it as one equation? Ps suggest how to do it. Class agrees/disagrees. T helps with the brackets if necessary. Let's check it. BB: $[(800 \div 4 + 10) \times 3 + 70] \div 7 = \underline{100}$ Repeat for, e.g. *Start with 20. Multiply by 8.* (160) *Add 20.* (180) *Divide by 60.* (3) *Add 60.* (63) *Divide by 9.* (7) *Multiply by 80.* (560) Show me . . . now! (560) Ps suggest how to write it as one equation (with T's help if necessary). BB: $[(20 \underset{160}{\times} 8 \overset{180}{+} 20) \overset{3}{\div} 60 \overset{63}{+} 60] \overset{7}{\div} 9 \times 80 = \underline{560}$ *10 min*	Whole class activity (but individual mental calculation) Wait until majority are ready before continuing to next step. Responses written on scrap paper or slates and shown in unison. Agreement, praising Discussion, agreement, checking, praising Remind Ps to use curved brackets for 1st set needed, then square brackets for 2nd set needed. Check that operations will be done in the correct order. You have been very clever!
3	**Boom!** Everyone stand up! We will count in multiples of 10 but you must say 'Boom' instead of the multiples of: a) <u>50</u>: '0, 10, 20, 30, 40, 'Boom', 60, 70, 80, 90, 'Boom', 110, . . .' b) <u>40 or 70</u>: '0, 10, 20, 30, Boom, 50, 60, Boom, Boom, 90, . . .' etc. Continue until fewer than 5 Ps remain standing. Let's give them a round of applause! *15 min*	Whole class activity At speed, in order round class Ps knock on desks when they hear a mistake and P who made it must sit down. In good humour! Ps can choose the 'Boom' multiples too.
4	**Secret numbers** I am thinking of a number. I will give you a clue and you must work out what it is. Show me the number when I say. a) *It is 300 more than half of 420.* Show me . . . now! (510) P who answered correctly explains to those who did not. Let's check each step to make sure it is correct. b) *If I multiply it by 5, then add 400, then divide by 11, the result is 50.* Show me . . . now! (30) P explains. Class checks each step. If time, Ps can think of secret numbers and give clues too! *20 min*	Individual work in *Ex. Bks*. Responses shown on scrap paper or slates in unison. BB: e.g. a) $n = 420 \div 2 + 300 = 210 + 300 = \underline{510}$ b) $n = (50 \times 11 - 400) \div 5 = (550 - 400) \div 5 = 150 \div 5 = \underline{30}$

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Bk4

Lesson Plan 11

Activity		*Notes*
5	**Inequalities** Which natural numbers will make the inequality true? Elicit that natural numbers are positive whole numbers. a) Class reads inequality aloud first. 'Five hundred plus the square is less than six hundred and eighteen minus one hundred and nine' What should we do first? (Work out the RHS.) Ps come to BB to do calculation, explaining reasoning. Class agrees/disagrees. Ps check with least and greatest possible values. BB: $500 + \square < 618 \overset{509}{-} 109$ $\square$: 1, 2, 3, 4, 5, 6, 7 or 8 b) Class reads the inequality aloud first. What should we do first? (Work out the LHS and RHS.) Ps come to BB to do calculations, explaining reasoning. Class agrees/disagrees. Ps check with least and greatest possible values. BB: $3 \overset{81}{\times} 27 + 150 < 200 + \bigcirc < 400 \overset{236}{-} 164$ $231 < 200 + \bigcirc < 236$ $\bigcirc$: 32, 33, 34, 35 *25 min*	Whole class activity Inequalities written on BB or SB or use enlarged copy master or OHP In unison Discussion, reasoning, agreement, checking, praising *Check:* BB: $500 + 1 < 509$ ✔ $500 + 8 < 509$ ✔ In unison Discussion, reasoning, agreement, checking, praising *Check:* BB: $231 < 200 + 32 < 236$ ✔ $231 < 200 + 35 < 236$ ✔
6	***Book 4, page 11*** Q.1 Read: *Do the calculations in the correct order.* Deal with one at a time. Ps write results of 1st calculations above the operation signs. Review at BB with whole class. Ps come to BB or dictate to T. Class agrees/disagrees. Mistakes discussed and corrected. *Solution:* a) $2 \overset{800}{\times} 400 - 258 = \underline{542}$ b) $3 \overset{420}{\times} 140 - 130 = \underline{290}$ c) $7 \overset{560}{\times} 80 + 258 = \underline{818}$ d) $220 + 4 \overset{360}{\times} 90 = \underline{580}$ e) $912 - 5 \overset{250}{\times} 50 = \underline{662}$ f) $595 - 6 \overset{420}{\times} 70 = \underline{175}$ *30 min*	Individual work, monitored, helped Written on BB or SB or use enlarged copy master or OHP Calculations can be done in *Ex. Bks* if Ps cannot do them mentally. Reasoning, agreement, self-correction, praising Feedback for T
7	***Book 4, page 11*** Q.2 Read: *Do the calculations in the correct order.* Deal with one at a time. Ps write results of 1st calculations above the operation signs . Review at BB with whole class. Ps come to BB or dictate to T. Class agrees/disagrees. Mistakes discussed and corrected. *Solution:* a) $640 \overset{80}{\div} 8 + 379 = \underline{459}$ b) $580 + 420 \overset{70}{\div} 6 = \underline{650}$ c) $910 - 480 \overset{60}{\div} 8 = \underline{850}$ d) $(1052 \overset{560}{-} 492) \div 7 = \underline{80}$ e) $810 \overset{90}{\div} 9 - 34 = \underline{56}$ f) $1200 \div (9 \overset{4}{-} 5) = \underline{300}$ *35 min*	Individual work, monitored, helped Written on BB or SB or use enlarged copy master or OHP Calculations can be done in *Ex. Bks* if Ps cannot do them mentally. Reasoning, agreement, self-correction, praising Feedback for T

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Bk4

Lesson Plan 11

Activity

8

Book 4, page 11

Q.3 Read: *Underline the data. Make a plan. Estimate, calculate and write the answer.*

Deal with one part at a time. Set a time limit. Ps read question themselves and solve it in *Pbs*. Remember to check your result if you have time. Ps sit up with arms folded when finished.

Review with the whole class. Ps come to BB to show solutions, explaining reasoning. Who agrees? Who did it a different way? Who made a mistake? What kind of mistake? etc.

Repeat for each of the other questions.

Solution:

a) *George has 324 stamps and Rita has 3 times as many as George. How many stamps does Rita have?*

Plan: G: 324, R: 324 × 3 *E*: 300 × 3 = 900

C: e.g. 324 × 3 = 900 + 60 + 12 = 972

Answer: Rita has 972 stamps.

b) *Helen has 324 postcards, which is 3 times as many as Mary has. How many postcards does Mary have?*

Plan: H: 324, M: 324 ÷ 3 *E*: 300 ÷ 3 = 100

C: e.g. 324 ÷ 3 = 300 ÷ 3 + 24 ÷ 3 = 100 + 8 = 108

Answer: Mary has 108 postcards.

c) *Steve has 324 marbles which is a quarter of the number of marbles that Jack has. How many marbles does Jack have?*

Plan: S: 324, J: 324 × 4 *E*: 300 × 4 = 1200

C: e.g. 324 × 4 = 1200 + 80 + 16 = 1296

Answer: Jack has 1296 marbles.

d) *Johnny has 324 football cards and Mike has 1 quarter of that number. How many football cards does Mike have?*
How many football cards do the two boys have altogether?

i) *Plan:* J: 324, M: 324 ÷ 4 *E*: 320 ÷ 4 = 80

C: e.g. 324 ÷ 4 = 320 ÷ 4 + 4 ÷ 4 = 80 + 1 = 81

Answer: Mike has 81 football cards.

ii) *Plan:* J + M: 324 + 81 *E*: 320 + 80 = 400

C: e.g. 324 + 81 = 320 + 80 + 4 + 1 = 400 + 5 = 405

Answer: They have 405 football cards altogether.

e) *Charlie has £324. How many matchbox cars can he buy with this money if each car costs £9? How much money would he have left?*

Plan: C: £324, 1 car: £9 No. of cars: £324 ÷ £9

C: e.g. 324 ÷ 9 = 270 ÷ 9 + 54 ÷ 9 = 30 + 6 = 36

Answer: Charlie can buy 36 cars and he would have no money left.

Who had all 5 problems correct? Let's give them '3 cheers'!

45 min

Notes

Individual work, monitored, helped.

Discussion, reasoning, agreement, self-correction, praising

Keep up a good pace throughout.

Accept any form of correct calculation, e.g.

3	2	4	×	3
9	7	2		
1				

	1	0	8
3	3	2	4
−	3		
		2	4
	−	2	4
			0

	3	2	4	×	4
1	2	9	6		
	1				

		8	1
4	3	2	4
−	3	2	
		0	4
		−	4
			0

	3	2	4
+		8	1
	4	0	5
	1		

Estimate can be done with the whole class here.

E: 30 < *N* < 40

		3	6
9	3	2	4
−	2	7	
		5	4
	−	5	4
			0

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Bk4

R: Mental calculation

C: Multiplication and division tables. Operations up to 1000

E: Operations up to 2000

Lesson Plan
12

Activity		*Notes*
1	**Secret number** I am thinking of a number. Try to find out what it is by asking me questions about it. I can answer only yes or no and your question must be different from the previous one. e.g. • Is it less than 1000? Yes • Does it have 3 digits? Yes • Is it more than 500? No • Is it a whole hundred? No • Is its hundreds digit odd? Yes • Is it less than 300? No • Is its tens digit less than 5? No • Is it more than 375? Yes • Is it less than 390? No • Does it have two digits the same? No • Is it odd? Yes • Is its units digit less than 5? Yes • It is <u>391</u>! Yes *5 min*	Whole class activity T chooses Ps at random to ask a question. Encourage Ps to ask logical questions and to keep in mind clues already found out from previous questions. Ps can make notes in *Ex. Bks*. At a good pace Extra praise for clever questions Repeat with another number if time (or P comes to front to think of a number and to answer questions.)
2	**Calculation practice** T dictates 5 numbers. Ps write them in *Ex. Bks,* one below the other, lining them up by place value. e.g. T: 567 318 9 935 76 Do these calculations in your *Ex. Bks*. Show me the result when I say. a) *What is the difference between the greatest and 2nd greatest numbers?* Show me . . . now! (368) Write a 'B' at the bottom of your page if you were correct. B b) *What is the sum of the three 3-digit numbers?* Show me . . . now! (1820) Write an 'E' at the bottom of your page if you were correct. E c) Divide the 2nd greatest number by the smallest number. Show me . . . now! (63) Write an 'S' at the bottom of your page if you were correct. S d) What is the product of the two smallest numbers? Show me . . . now! (684) Write a 'T' at the bottom of your page if you were correct. T What word did you make if you got them all correct? (BEST) *13 min*	Individual work but class kept together Responses written on scrap paper or slates. Quick check after each one. Ps who answered correctly come to BB to explain to Ps who were wrong. Reasoning, agreement, self-correcting, praising BB: $\begin{array}{r} 9\,{}^{10}3\,{}^{10}5 \\ -\ 5_1\,6_1\,7 \\ \hline 3\,6\,8 \end{array}$ $\begin{array}{r} 567 \\ 318 \\ +\ 935 \\ \hline 1820 \end{array}$ (1, 2) $\begin{array}{r} 63 \\ 9\,\overline{)\,567} \\ -\ 54 \\ \hline 27 \\ 27 \\ \hline 0 \end{array}$ $\begin{array}{r} 76 \times 9 \\ \hline 684 \end{array}$ (5) Ps shout out in unison. Praising

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Bk4

Lesson Plan 12

Activity		*Notes*
3	**Multiplication** Let's show these multiplications in detail to remind ourselves what we are doing. Ps come out to work on BB and rest of class work in *Ex. Bks*. BB: a) 216 × 1 = 216 216 × 2 = 432 216 × 3 = 648 216 × 4 = 864 216 × 5 = 1080 shorter way: 216 × 2 = 432 (1); 216 × 3 = 648 (1); 216 × 4 = 864 (2); 216 × 5 = 1080 (3) b) 314 × 4 = 1256 234 × 4 = 936 shorter way: 314 × 4 = 1256 (1); 234 × 4 = 936 (1 1) Details of reasoning: e.g. 314×4: $4 \times 4U = 16U = 1T + \underline{6U}$ $4 \times 1T = 4T$; $4T + 1T = \underline{5T}$ $4 \times 3H = 12H = \underline{1\,Th} + \underline{2H}$ *20 min*	Whole class activity Written on BB or use enlarged copy master or OHP Encourage Ps to give reasoning with details of place-value (as example below) Agreement, praising Use the expressions to show: • place value (e.g. 5T) • digit value (e.g. 5) • real value (e.g. 50) If any P still does not understand, ask them to do another example on BB (with help of rest of class)
4	***Book 4, page 12*** Q.1 Read: *Estimate the product first, then do the multiplication.* Set a time limit. Ask Ps to estimate to the nearest 10. Review at BB with whole class. Ps come to BB or dictate to T, explaining reasoning in detail. Class agrees/disagrees. Mistakes discussed and corrected. If problems, show multiplication in long form on BB. *Solution:* a) *E:* 420; 73 × 6 = 438 (1); *E:* 450; 146 × 3 = 438 (1 1); *E:* 750; 246 × 3 = 738 (1 1); *E:* 1050; 346 × 3 = 1038 (1 1) b) *E:* 400; 47 × 8 = 376 (5); *E:* 450; 147 × 3 = 441 (1 2); *E:* 900; 147 × 6 = 882 (2 4); *E:* 750; 247 × 3 = 741 (1 2) *26 min*	Individual work, monitored, helped Written on BB or use enlarged copy master or OHP Reasoning, agreement, self-correction, praising Feedback for T Ps point out relationships. e.g. doubling one term and halving the other term gives the same result, etc.

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Bk4

Lesson Plan 12

Activity

5

Division

Let's do the division in different ways. Ps dictate what T should write (horizontal division), or come to BB (vertical division), explaining reasoning. Who agrees? Who can do it another way? etc.

T demonstrates shorter way if no P has done so, with place-value details.

BB:

a) $476 \div 2 = 400 \div 2 + 70 \div 2 + 6 \div 2 = 200 + 35 + 3 = \underline{238}$

	2	3	8
2	4	7	6
−	4		
	0	7	
	−	6	
		1	6
	−	1	6
			0

Shorter way

	2	3	8
2	4	7	6
		1	

Details: $4H \div 2 = \underline{2H}$

$7T \div 2 = \underline{3T}$, and 1T remains

$1T + 6U = 16U$

$16U \div 2 = \underline{8U}$

b) $812 \div 7 = 700 \div 7 + 70 \div 7 + 42 \div 7 = 100 + 10 + 6 = \underline{116}$

	1	1	6
7	8	1	2
−	7		
	1	1	
	−	7	
		4	2
	−	4	2
			0

Shorter way

	1	1	6
7	8	1	2
	1	4	

Details: $8H \div 7 = \underline{1H}$, and 1H remains

$1H + 1T = 11T$

$11T \div 7 = \underline{1T}$, and 4T remains

$4T + 2U = 42U$

$42U \div 7 = \underline{6U}$

c) $714 \div 6 = 600 \div 6 + 60 \div 6 + 54 \div 6 = 100 + 10 + 9 = \underline{119}$

	1	1	9
6	7	1	4
−	6		
	1	1	
	−	6	
		5	4
	−	5	4
			0

Shorter way

	1	1	9
6	7	1	4
	1	5	

Details: $7H \div 6 = \underline{1H}$, and 1H remains

$1H + 1T = 11T$

$11T \div 6 = \underline{1T}$, and 5T remains

$5T + 4U = 54U$

$54U \div 6 = \underline{9U}$

d) $735 \div 5 = 500 \div 5 + 200 \div 5 + 35 \div 5 = 100 + 40 + 7 = \underline{147}$

	1	4	7
5	7	3	5
−	5		
	2	3	
−	2	0	
		3	5
	−	3	5
			0

Shorter way

	1	4	7
5	7	3	5
	2	3	

Details: $7H \div 5 = \underline{1H}$, and 2H remains

$2H + 3T = 23T$

$23T \div 5 = \underline{4T}$, and 3T remains

$3T + 5U = 35U$

$35U \div 5 = \underline{7U}$

35 min

Notes

Whole class activity

Divisions written on BB or SB or OHT

Use squared board if possible or grids drawn on BB or use enlarged copy master for long and short vertical division.

Allow Ps to show the methods of calculation, with rest of class pointing out errors.

T could show how to do the first short division in detail, then Ps could do the others (with T's help).

At a good pace

Reasoning, agreement

Praising, encouragement only

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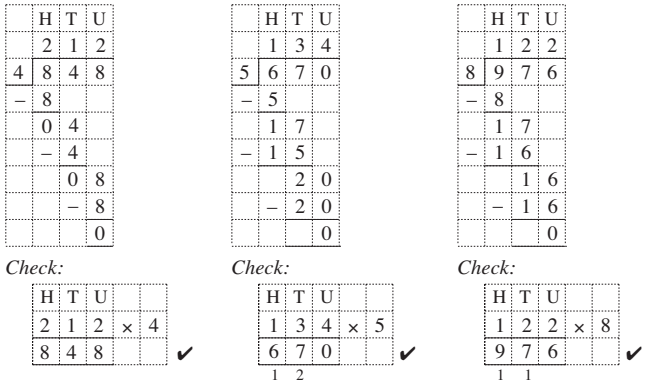
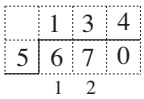
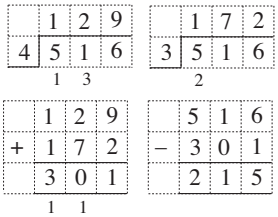
Bk4

Lesson Plan 12

Activity		*Notes*
6	***Book 4, page 12*** Q.2 Read: *Estimate the quotient first, then do the division. Check with multiplication.* Ps estimate by rounding to nearest 100. Ps can use long or short division. Deal with one part at a time if Ps are unsure. Review at BB with whole class. Ps come to BB to do calculations, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected. *Solution:* a) *E:* 200 b) *E:* 140 (700 ÷ 5) c) *E:* e.g. 125 (1000 ÷ 8)  *Check:* ✔ ✔ ✔ *40 min*	Individual work, monitored, helped Written on BB or use enlarged copy master or OHP Ps give details of how they estimated and also say what they are doing when showing calculations. Extra praise if Ps used short division correctly and can explain reasoning! e.g.  b) 6H ÷ 5 = 1H, and 1H remains 1H + 7T = 17T 17T ÷ 5 = 3T, and 2T remain 2T + 0U = 20U 20U ÷ 5 = 4U Feedback for T
7	***Book 4, page 12*** Q.3 Read: *Underline the data. Make a plan. Estimate, calculate and write the answer.* Deal with one part at a time. Ps read problem themselves and write just a plan for each first. Review plans with the whole class. **A**, what plan did you write? Who wrote the same? Who wrote a different one? etc. Class agrees on which plans are correct Mistakes corrected. Then Ps estimate, calculate and write the answers. Ps can use *Ex. Bks* for calculations and write only plans and answers in *Pbs*. Review with whole class. Ps come to BB to do calculations, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected. *Solution:* a) *Lisa had collected 516 shells. She gave 1 quarter of the shells to Alice and 1 third of them to Julie. How many shells did Lisa have left?* *Plan:* L: 516, A: 516 ÷ 4, J: 516 ÷ 3 L had left: 516 – 516 ÷ 4 – 516 ÷ 3 or 516 – (516 ÷ 4 + 516 ÷ 3) *C:* e.g. 516 ÷ 4 = 400 ÷ 4 + 80 ÷ 4 + 36 ÷ 4 = 100 + 20 + 9 = 129 A: 129 516 ÷ 3 = 300 ÷ 3 + 210 ÷ 3 + 6 ÷ 3 = 100 + 70 + 2 = 172 J: 172 A + J: 129 + 172 = 229 + 72 = 299 + 2 = 301 L – (A + J): 516 – 301 = 215 *Answer:* Lisa had 215 shells left.	Individual work in writing plans first, monitored, helped Discuss correct plans with whole class before calculating. Individual work in calculating (or done with whole class if time is short) Reasoning, agreement, self-correction, praising *E*: 500 – 100 – 200 = 200 Or BB:  *Check:* 129 + 172 + 215 = 516

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Bk4		*Lesson Plan 12*
Activity		***Notes***
7	(Continued) b) *Darren bought 5 pairs of sports socks for £7.75. Jamie bought 6 pairs of the same kind of socks. How much did Jamie pay?* *Plan:* D: 5 pairs → £7.75 = 775 p, 1 pair → 775 p ÷ 5 J: 6 pairs → (775 p ÷ 5) × 6 *C:* e.g. 775 ÷ 5 = 500 ÷ 5 + 250 ÷ 5 + 25 ÷ 5 = 100 + 50 + 5 = 155 (p) 155 × 6 = 100 × 6 + 50 × 6 + 5 × 6 = 600 + 300 + 30 = 930 (p) 930 p = £9.30 *Answer:* Jamie paid £9.30	Agreement on plan first, then individual calculation Reasoning, agreement, self-correcting, praising *E*: 800 ÷ 5 × 6 = 160 × 6 = 960 (p) Or BB: or 6 pairs = 5 pairs + 1 pair
	45 min	

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Bk4

R: Mental calculation (4 operations)
C: Written calculation. Division with remainders. Divisibility
E: Numbers up to 2000. Problems in context

Lesson Plan 13

Activity		***Notes***
1	**Addition and subtraction practice** Let's fill in the missing numbers. Ps come out to BB to write missing values, saying whole equation and explaining reasoning. Class agrees/ disagrees. Check with reverse operation. BB: a) 36 + **50** = 86 b) **40** + 57 = 97 c) 84 – **70** = 14 d) **72** – 30 = 42 e) 236 + **50** = 286 f) **40** + 357 = 397 g) 584 – **70** = 514 h) **472** – 30 = 442 i) 236 + **450** = 686 j) **240** + 357 = 597 k) 584 – **270** = 314 l) **572** + 130 = 442 *5 min*	Whole class activity Written on BB or SB or OHT or use enlarged copy master At a good pace Agreement, praising Feedback for T
2	**Multiplication and division practice** Let's fill in the missing numbers. Ps come out to BB to write missing values, saying whole equation and explaining reasoning. Class agrees/ disagrees. Check with reverse operation. BB: a) **50** × 3 = 150 b) **3** × 60 = 180 c) **20** × 9 = 180 d) **8** × 70 = 560 e) 40 × **20** = 800 f) **25** × 4 = 100 g) 250 × **4** = 1000 h) **35** × 20 = 700 i) 320 ÷ **8** = 40 j) 450 ÷ **50** = 9 k) **300** ÷ 6 = 50 l) **420** ÷ 70 = 6 *10 min*	Whole class activity Written on BB or SB or OHT or use enlarged copy master At a good pace Agreement, praising Feedback for T
3	**Sequences** T says and writes on BB the first few terms of a sequence. Ps note terms in *Ex. Bks* and work out the rule. Let's continue the sequence. What is the rule? Who agrees? Who can express it in a different way? etc. a) 1, 5, 9, 13, (17, 21, 25, 29, 33, 37, 41, 45, 49, 53, 57, . . .) *Rule:* Increasing by 4, or gives a remainder of 1 after dividing by 4 b) 18, 33, 48, 63, (78, 93, 108, 123, 138, 153, 168, 183, . . .) *Rule:* Increasing by 15, or gives a remainder of 3 after dividing by 15 (or by 5) c) 11, 111, 211, 311, (411, 511, 611, 711, 811, 911, 1011, . . .) *Rule:* Increasing by 100, or gives a remainder of 11 after dividing by 100 (or by 50 or by 20) *15 min*	Whole class activity At speed in order round class Class points out errors. Discussion, agreement on the rule. If disagreement, check one or two terms, e.g. BB: 138 = 15 × 9 + ③ or 9 1 5 1 3 8 – 1 3 5 3 711 = 7 × 100 + ⑪

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Bk4		*Lesson Plan 13*
Activity		***Notes***
4	**Problems** Listen carefully, note the data, do the calculation in your *Ex. Bks.* and show me the result when I say. a) *Rabbit 's burrow is 216 m from the woods. If one day Rabbit makes 2 journeys to the wood and back, what distance did he cover that day?* Show me . . . now! (864 m) P who responded correctly explains to those who did not. e.g. He made 2 journeys there and back so he covered the distance 4 times. *C:* $216 \times 4 = 200 \times 4 + 10 \times 4 + 6 \times 4$ or $= 800 + 40 + 24$ $= \underline{864}$ (m) 2 1 6 × 4 8 6 4 2 *Answer:* Rabbit covered 864 m. b) *Dan measured the length of his exercise book 5 times and found it was 295 mm each time. How wide is Dan's exercise book?* Show me . . . now! (295 mm) No calculation is needed. The width is given in the question! *Answer:* Dan's exercise book is 295 mm wide. *19 min*	Whole class activity T repeats each question slowly and a P repeats in own words. Give Ps time to think and calculate. Results written on scrap paper or slates and shown in unison. Reasoning, agreement, self-correction, praising T stresses that Ps should listen to (or read) questions carefully and picture them in their heads. Imagine yourself measuring your own *Ex. Bk.* 5 times!
5	**Divisibility** Let's make 2-digit numbers from the digits 0, 1, 2, 3, 4 and 5 so that they are divisible by a) 2 (10, 12, 14, 20, 22, 24, 30, 32, 34, 40, 42, 44, 50, 52, 54) b) 3 (12, 15, 21, 24, 30, 33, 42, 45, 51, 54) c) 4 (12, 20, 24, 32, 40, 44, 52) d) 5 (10, 15, 20, 25, 30, 35, 40, 45, 50, 55) e) 7 (14, 21, 35, 42) If a P makes a mistake, show it by reasoning with division. e.g. • 3 is <u>not</u> a factor of 52, because $52 \div 3 = 30 \div 3 + 22 \div 3$ $= 10 + 7, \text{r } 1 = \underline{17, \text{r } 1}$ • 43 is <u>not</u> divisible by 4, because $43 \div 4 = \underline{10, \text{r } 3}$ *25 min*	Whole class activity T write digits on BB Ps dictate the 2-digit numbers Class points out errors. Agreement, checking in case of mistake, praising Show details of more difficult cases, e.g. $52 \div 2 = 40 \div 2 + 12 \div 2$ $= 20 + 6 = \underline{26}$ $54 \div 3 = 30 \div 3 + 24 \div 3$ $= 10 + 8 = \underline{18}$

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Bk4

Lesson Plan 13

Activity		*Notes*
6	***Book 4, page 13*** Q.1 Read: *Calculate the quotient and the remainder. Check with multiplication.* Deal with one part at a time. Review at BB with whole class. Ps come to BB (with their *Pbs*) to do calculation and explain reasoning. Class points out errors. Mistakes discussed/corrected. *Solution:*	Individual work, monitored, helped (or part a) done with whole class first if Ps are unsure) Written on BB or use enlarged copy master or OHP Reasoning, agreement, self-correcting, praising Accept any correct method of calculation (horizontal division in *Ex. Bks*, long division or short division) Ps circle remainders and/or write beside answers. Feedback for T

a)

	H	T	U	
	1	0	7	r 5
6	6	4	7	
–	6			
	0	4	7	
	–	4	2	
			5	

Check:

H	T	U		
1	0	7	×	6
6	4	2		
	+	5		
6	4	7		✔

b)

	H	T	U	
	1	2	4	r 4
7	8	7	2	
–	7			
	1	7		
–	1	4		
		3	2	
	–	2	8	
			4	

Check:

H	T	U		
1	2	4	×	7
8	6	8		
	+	4		
8	7	2		✔

c)

	H	T	U	
	2	3	7	r 1
4	9	4	9	
–	8			
	1	4		
–	1	2		
		2	9	
	–	2	8	
			1	

Check:

H	T	U		
2	3	7	×	4
9	4	8		
	+	1		
9	4	9		✔

31 min

7	***Book 4, page 13*** Q.2 Read: *Is 642 divisible by these numbers? Do the calculations, then write YES or NO.* How can we tell whether a number is divisible by another number? (After doing the division there will be no remainder.) Set a time limit. Ps do long or short division (or horizontal division in *Ex. Bks* if they prefer) and write YES or NO on dotted lines in *Pbs*. Review at BB with whole class. T points to a number. Is 642 divisible by this number? Class shouts YES or NO in unison. Ps who respond incorrectly come to BB to do calculation (with help of class). Mistakes corrected. Agree that 642 is divisible by 3 and 6, but <u>not</u> by 4 and 9. Elicit that 3 and 6 are <u>factors</u> of 642 (642 is a multiple of 3 and 6). *Solution:*	Individual work, monitored, helped Differentiation by time limit Written on BB or use enlarged copy master or OHP Reasoning, agreement, self-correcting, praising T shows another way to reason, e.g. BB: 642 = 600 + 30 + 12 (all divisible by 3 and 6) or 642 = 630 + 9 + 3 (630 and 9 are divisible by 9 but 3 is not) or 642 = 400 + 240 + 2 (400 and 240 are divisible by 4 but 2 is not)

a) 3 YES

	2	1	4
3	6	4	2
–	6		
	0	4	
	–	3	
		1	2
	–	1	2
			0

b) 4 NO

	1	6	0
4	6	4	2
–	4		
	2	4	
–	2	4	
		0	2

c) 6 YES

	1	0	7
6	6	4	2
–	6		
	0	4	2
	–	4	2
			0

d) 9 NO

		7	1
9	6	4	2
–	6	3	
		1	2
	–		9
			3

36 min

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Bk4

Lesson Plan 13

Activity		*Notes*
8	***Book 4, page 13*** Q.3 Read: *Do the calculations in your exercise book. Write the answers in the boxes.* Set a time limit. Ps read questions themselves, do calculations and write results in *Pbs*. Review with whole class. T (or P) reads each question and class show solutions on command. Ps who respond correctly explain at BB to those who were wrong. Mistakes corrected. *Solution:* a) *Which number is three times as much as 264?* (792) BB: e.g. $264 \times 3 = 600 + 180 + 12 = \underline{792}$ b) *Three times a numbers is 264. What is the number?* (88) BB: e.g. $264 \div 3 = 240 \div 3 + 24 \div 3 = 80 + 8 = \underline{88}$ c) *Which number is 1 third of 426?* (142) BB: e.g. $426 \div 3 = 300 \div 3 + 120 \div 3 + 6 \div 3$ $= 100 + 40 + 2 = \underline{142}$ d) *One third of a number is 426. What is the number?* (1278) BB: e.g. $426 \times 3 = 1200 + 60 + 18 = \underline{1278}$ *40 min*	Individual work, monitored, helped Ps may use any correct method of calculation. Responses shown on scrap paper or slates in unison. Reasoning, agreement, self-correction, praising or or or or
9	**Remainders** Let's practise finding remainders. Ps dictate numbers to T who writes on BB as a sequence. Class points out errors or missed numbers. T decides when to skip some terms and continue from other numbers. a) *Tell me the natural numbers which have a remainder of* i) *1 after they have been divided by 3,* e.g. 1, 4, 7, 10, 13, 16, 19, . . ., 601, . . ., 820, . . . Elicit that they are 1 more than multiples of 3. ii) *2 after dividing by 3,* e.g. 2, 5, 8, 11, . . ., 602, . . ., 821, . . . Elicit that they are 2 more than multiples of 3. iii) *1 after dividing by 7* e.g. 1, 8, 15, 22, 29, . . ., 351, . . ., 904, . . . Elicit that they are 1 more than multiples of 7. b) ***Book 4, page 13, Q.4*** Read: *Write 2-digit numbers which have a remainder of 6 after dividing by 7.* Give Ps time to write numbers in *Pbs*. Then Ps dictate numbers to T who writes them on BB as a sequence. Class points out errors or missed numbers. BB: 13, 20, 27, 34, 41, 48, 55, 62, 69, 76, 83, 90, 97 Elicit that they are 6 more (or 1 less) than multiples of 7 *45 min*	Whole class activity Elicit that natural numbers are positive whole numbers. At speed in order round class Check on BB that new 3-digit start numbers have the correct remainder, e.g. BB: $820 = 600 + 210 + 9 + (1)$ $351 = 350 + (1)$ $904 = 700 + 140 + 63 + (1)$ Individual work, monitored (or continue as whole class activity) Agreement, self-correcting praising

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Bk4

R: Mental calculations
C: Written calculations. Division (with remainders). Divisibility
E: Numbers up to 2000. Problems.

Lesson Plan *14*

Activity		*Notes*
1	**Forming rectangles** Let's draw different rectangles which have a perimeter of 24 units. Elicit that 1 unit is the side of a grid square. Ps come to BB to draw rectangles on the grid, confirming perimeter length by writing an operation. What is its area? e.g. BB: 11, 1: $P = 2 \times 1 + 2 \times 11 = \underline{24}$ (units); $A = \underline{11}$ (unit squares) 10, 2: $P = 2 \times (2 + 10) = 2 \times 12 = \underline{24}$ (units); $A = 2 \times 10 = \underline{20}$ (unit squares) 9, 3: $P = 2 \times (3 + 9) = 2 \times 12 = \underline{24}$ (units); $A = 3 \times 9 = \underline{27}$ (unit squares) 8, 4: $P = 2 \times (4 + 8) = 2 \times 12 = \underline{24}$ (units); $A = 4 \times 8 = \underline{32}$ (unit squares) 7, 5: $P = 2 \times (5 + 7) = 2 \times 12 = \underline{24}$ (units); $A = 5 \times 7 = \underline{35}$ (unit squares) 6, 6 square: $P = 2 \times (6 + 6) = 2 \times 12 = \underline{24}$ (units); $A = 6 \times 6 = \underline{36}$ (unit squares) Extra praise for unexpected sides e.g. $11\frac{1}{2}$, $\frac{1}{2}$: $P = 2 \times (11\frac{1}{2} + \frac{1}{2}) = 2 \times 12 = \underline{24}$ (units) $A = 5 + 1$ half $+ 1$ quarter $= 5 + 3$ quarters $= \underline{5\frac{3}{4}}$ (unit squares) *10 min*	Whole class activity Grid drawn on BB or use squared BB or enlarged copy master or OHP Ps could have copies on desks too if they wish. At a good pace Reasoning, agreement, praising T helps with writing operations where necessary. [Revision of perimeter and area of a rectangle (square).] What do you notice? Agree that the 24-unit perimeter which gives the largest area is the most regular shape, i.e. a square. If a P suggests this case, T helps with calculating the area.
2	***Book 4, page 14*** Q.1 Read: *The area of a rectangle is 360 unit squares.* *How long is the other side if one side is:* *a) 5 units, b) 12 units, c) 8 units?* T or P explains task with aid of a diagram. Elicit that the operation to be done is division. Ps can do calculations in *Ex. Bks* if they cannot do them mentally. Review at BB with whole class. Ps come to BB to show their calculations. Who agrees? Who did it another way? etc. *Solution:* e.g. a) $360 \div 5 = 350 \div 5 + 10 \div 5 = 70 + 2 = \underline{72}$ (units) b) $360 \div 12 = 360 \div 6 \div 2 = 60 \div 2 = \underline{30}$ (units) c) $360 \div 8 = 320 \div 8 + 40 \div 8 = 40 + 5 = \underline{45}$ (units)	Individual work, monitored, helped but whole class introduction BB: $A = 360$, b, c $A = b \times c$ $= \underline{360}$ unit squares $b = A \div c$, $c = A \div b$ Reasoning, agreement, self-correcting, praising (or vertical long or short division)

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Bk4

Lesson Plan 14

Activity		*Notes*
2	(Continued) Read: *Calculate the perimeter of each rectangle.* Review at BB with whole class. Ps dictate operations to T, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected. *Solution:* a) $P = 2 \times (5 + 72) = 2 \times 77 = \underline{154}$ (units) b) $P = 2 \times (12 + 30) = 2 \times 42 = \underline{84}$ (units) c) $P = 2 \times (8 + 45) = 2 \times 53 = \underline{106}$ (units)	Individual work, monitored, helped Reasoning, agreement, self-correction, praising.
Extension	How could we show the sides of all the rectangles which have an area of 360 unit squares? T asks several Ps what they think. Agree that best way would be to show them in a table. T (or P) draws table on BB or OHT. Let's do it logically! Which values should be put in the first column? (e.g. 1 and 360) Ps dictate to T or come to BB, explaining reasoning. Encourage Ps to do the calculations mentally. Class points out errors. What is the rule for the table? Who can write it a different way? etc. BB:	Whole class activity (or individual or paired work within a time limit if Ps prefer, reviewed at BB with whole class) At a good pace Reasoning, agreement, praising Then table carries on with values reversed.

b	1	2	3	4	5	6	8	9	10	12	15	18
c	360	180	120	90	72	60	45	40	36	30	24	20

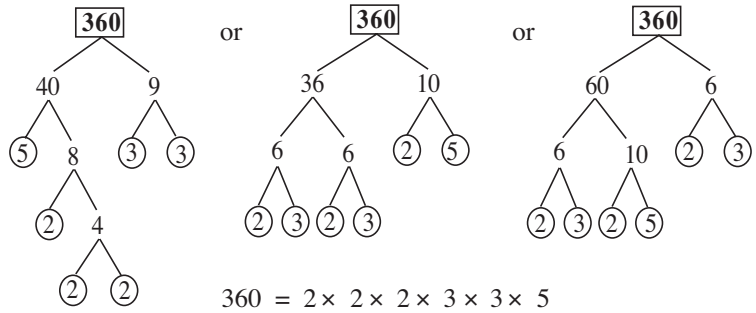
Rule: $b = 360 \div c$, $c = 360 \div b$, $(b \times c = 360)$

What could we say about all the numbers in the table? (They are all factors of 360.)

Discussion on the rule.

Agreement, praising

18 min

3	**Factorising** Let's break down 360 into its lowest factors T shows the first 1 or 2 steps on BB and Ps continue the diagram. Class agrees/disagrees. BB: e.g.  $360 = 2 \times 2 \times 2 \times 3 \times 3 \times 5$ What kind of numbers have we circled? (Prime numbers). What is a prime number? (A number which has only 2 factors: 1 and itself.) We can say that we have broken down 360 into its <u>prime factors</u>. Does it matter how we do factorisation? (No, as we will always end up with the same prime factors.)	Whole class activity Ps decide how to break down the factors. Try it in 2 or 3 different ways If a factor cannot be broken down further, Ps draw a circle around it. At a good pace Agreement, praising Check by multiplying the circled factors in increasing order. BB: <u>Prime number</u> factors: 1 and itself

23 min

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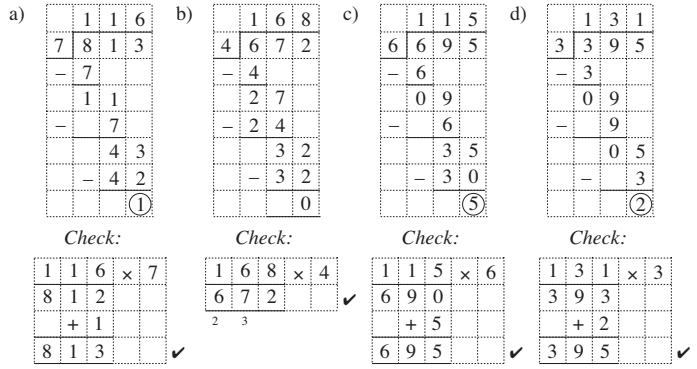
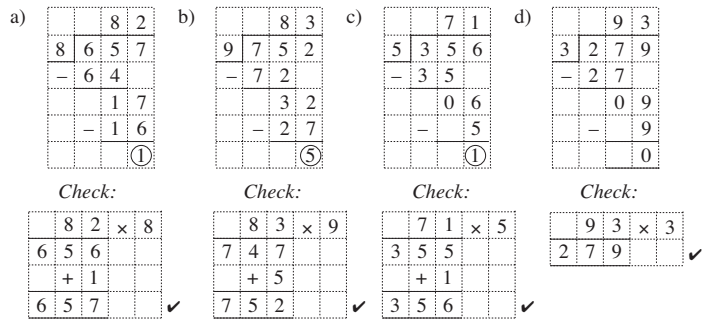
Bk4

Lesson Plan 14

Activity		*Notes*
4	***Book 4, page 14*** Q.2 Read: *Practise division*. Check your divisions with multiplication in your head (or in your *Ex*. *Bks*) if you have time. T sets a time limit. Review at BB with whole class. Ps come to BB or dictate to T, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected. Do checks on BB with whole class. Ps dictate what T should write. *Solution:*  *31 min*	Individual work, monitored, (helped) Written on BB or use enlarged copy master or OHP Accept long or short vertical division. Differentiation by time limit Reasoning, agreement, checking, self-correction, praising Feedback for T
5	***Book 4, page 14*** Q.3 Read: *Practise division*. Check your divisions with multiplication in your head (or in your *Ex*. *Bks*) if you have time. T sets a time limit. Review at BB with whole class. Ps come to BB or dictate to T, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected. Do checks on BB with whole class. Ps dictate what T should write. *Solution:*  *39 min*	Individual work, monitored, (helped) Written on BB or use enlarged copy master or OHP Accept long or short vertical division. Differentiation by time limit Reasoning, agreement, checking, self-correction, praising Feedbck for T

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Bk4

Lesson Plan 14

Activity		*Notes*
6	***Book 4, page 14***	
	Q.4 Read: *Do the calculations and write the answers in your exercise book.*	Individual work, monitored, helped
	Try to picture the problem in your head. Draw a diagram if it will help you.	(or all done as whole class activity if time is short)
	For a) and b), Ps read problem themselves, do calculation and write answer as a sentence in *Ex. Bks*.	
	Review with the whole class. Ps come to BB to do calculations, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected.	Discussion, reasoning, agreement, self-correction, praising
	Solution:	
	a) *A floor tile is 205 mm wide. How wide is the utility room if 9 tiles laid end to end are needed for each row?*	
	Plan: 1 tile: 205 mm, 9 tiles: 205 mm × 9	
	C: e.g. $205 \times 9 = 200 \times 9 + 5 \times 9 = 1800 + 45 = \underline{1845}$ (mm)	or
		1845 mm = 1 m 84 cm 5 mm
	Answer: The utility room is 1 m 84 cm 5 mm wide.	
	b) *4 sacks of wheat weigh 304 kg altogether. How much wheat, on average, is in each sack?*	
	Plan: 4 sacks: 304 kg, 1 sack: 304 kg ÷ 4	
	C: e.g. $304 \div 4 = 280 \div 4 + 24 \div 4 = 70 + 6 = \underline{76}$ (kg)	or
	Answer: On average, there is 76 kg of wheat in each sack.	
	Why do we say 'on average'? (Because there might be 76 kg in each sack but there could also be, e.g.	Whole class discussion
	78 kg in sack 1, 74 kg in sack 2, 75 kg in sack 3, 77 kg in sack 4.	Allow Ps time to think and explain. T gives hints only if necessary.
	which also give a total of 304 kg.)	
	c) Read: *Study the diagram. Make up a question about it.*	Individual (or paired) work, monitored
	Set a time limit. Ps (Ps can work in pairs.)	Diagram drawn on BB or use enlarged copy master or OHP
	Review at BB with whole class. Ps suggest questions. Class agrees whether they are valid. Deal with all cases.	Whole class discussion. Praise all contributions.
	e.g. *If a man walks at a steady speed and takes 7 minutes to cover 420 m, how far did he walk in in the first minute?*	
Extension	T (or class) chooses the 'best' one to solve. Ps come to BB or dictate what T should write. P who thought of the question decides whether the solution is correct.	Extra praise if Ps realise the similarity to part b).
	e.g. 7 minutes: 420 m 1 minute: 420 m ÷ 7 = <u>60 m</u>	i.e. the man has to walk at a <u>steady</u> speed, otherwise we can only work out the <u>average</u> distance he covered per minute.
	Let's give them a round of applause!	
	45 min	

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Bk4	R: Mental calculation. **C: Written calculations. Divisibility** *E: Numbers up to 2000. Problems*	*Lesson Plan* *15*
Activity		***Notes***
1	**Boom!** Everyone stand up. I will say the first few terms of a sequence and you must continue it but you must say 'boom' instead of any number divisible by 9. a) 3, 6, (boom, 12, 15, boom, 21, 24, boom, 30, 33, boom, . . .) b) 2, 4, 6, (8, 10, 12, 14, 16, boom, 20, 22, 24, 26, 28, . . .) c) 10, 20, 30, (40, 50, 60, 70, 80, boom, 100, 110, 120, . . .) This time you must say 'boom' instead of any number divisible by either 4 or 6! d) 1, 2, 3, boom, 5, boom, 7, boom, 9, 10, 11, boom, 13, . . .) *6 min*	Whole class activity At speed in order round class. Ps who make a mistake sit down and the next P corrects their mistake. Class points out mistake if next P misses it. In good humour! Class applauds Ps still standing at the end.
2	**Calculation practice** T asks questions and Ps calculate in *Ex. Bks* (or mentally). Ps write answers on scrap paper or slates and show to T on command. Ps who responded correctly explain at BB to those who did not. Who did the same? Who did it another way? Who made a mistake? What was your mistake? etc. a) *What is 4 times the sum of of 176 and 49?* Show me . . . now! (900) e.g. 176 + 49 = 175 + 50 = 225; 225 × 4 = 800 + 100 = <u>900</u> b) *What is 4 times the difference between 176 and 49?* Show me . . . now! (508) e.g. 176 – 49 = 177 – 50 = 127; 127 × 4 = 480 + 28 = <u>508</u> c) *What is the sum of 176 and 4 times 49?* Show me . . . now! (372) e.g. 49 × 4 = 160 + 36 = 196, or 49 × 4 = 50 × 4 – 4 = 196; 176 + 196 = 276 + 96 = 276 + 100 – 4 = 376 – 4 = <u>372</u> d) *What is the difference between 4 times 176 and 49?* Show me . . . now! (655) e.g. 176 × 4 = 400 + 280 + 24 = 680 + 24 = 704; 704 – 49 = 705 – 50 = <u>655</u> *14 min*	Whole class activity but individual work in *Ex. Bks*. Give Ps time to do calculations/write answers. Responses shown in unison. Reasoning, agreement, praising Accept any correct method of calculation. e.g. a) d) Extra praise for 'quick' ways. Feedback for T
3	**Multiplication practice** T has numbers already written on BB. BB: $A = \{108, 247, 319\}$ $B = \{3, 4\}$ a) Let's write multiplications using a number from *Set A* and a number from *Set B*. Ps come to BB or dictate what T should write. e.g. 108 × 3 = 247 × 3 = 313 × 3 = 108 × 4 = 247 × 4 = 319 × 4 = b) Which would give the smallest product? (108 × 3 = 324) c) Which would give the greatest product? (319 × 4 = 1276) d) Which would give an even number as the product? 108 × 3 → ④, 108 × 4 → ②, 247 × 4 → ⑧, 319 × 4 → ⑥ Agree that <u>any</u> number times an even number → an even product.	Whole class activity BB or SB already prepared Agreement, praising Smallest multiplicant and the smallest multiplier Greatest multiplicant and the greatest multiplier Only the units digit needs to be considered.

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Bk4

Lesson Plan 15

Activity		***Notes***
3	(Continued) e) Which would give an odd number as the product? $247 \times 3 \rightarrow$ ① $313 \times 3 \rightarrow$ ⑨ (Odd × odd → odd product) f) Which numbers in *Set A* are divisible by 3? (108, as $108 = 90 + 18$) ($247 = 240 + 6 +$ ① and $319 = 300 + 18 +$ ①, so not divisible by 3) g) Which numbers in *Set B* are divisible by 4? (108, as $108 = 100 + 8$) (the other two numbers are odd, so are <u>not</u> divisible by 4) *22 min*	Only the units digit needs to be considered. Ps might want to do all the divisions in long or short form to check.
4	***Book 4, page 15, Q.1*** Read: *Which numbers can be written instead of the letters?* Deal with one at a time. Class reads each statement in unison. Ps suggest which operation to do first and how to continue. Ps come to BB to do calculations, explaining reasoning. Class points out errors. *Solution:* $157 \times 3 + a = 196 + 285$ $471 + a = 481$ $a = 481 - 471$ <u>$a = 10$</u> $b + 136 \times 2 = 640 \div 8 + 292$ $b + 272 = 372$ $b = 372 - 272$ <u>$b = 100$</u> $376 + 287 \leq c - 126 \leq 134 \times 5$ $663 \leq c - 126 \leq 670$ $789 \leq c \leq 796$ <u>c: 789, 790, 791, 792, 793, 794, 795, 796</u> $364 \div 7 + 100 < 160 - d < 55 \times 3 - 8$ $52 + 100 < 160 - d < 165 - 8$ $152 < 160 - d < 157$ <u>d: 7, 6, 5, 4</u> *30 min*	Whole class activity (If some Ps wish to try the first 3 statements individually, let them) Written on BB or SB or OHT At a good pace Results of operations can be written above the operation signs or in a new line as shown here. Discussion, reasoning, agreement, (self-correction if done individually), praising T will probably need to help with d. Demonstrate on class number line if problems.
5	***Book 4, page 15*** Q.2 Read: *One quarter of a path has already been paved. How much has been done if the whole path is 792 m long?* Elicit that the shaded part in the diagram is the part already paved. Review at BB with whole class. Ps come to BB to write plan, estimate, calculate, check and write the answer as a sentence. Class points out errors. Mistakes discussed and corrected. *Solution:* *Plan:* 792 m ÷ 4 *Estimation:* 800 ÷ 4 = 200 *Answer:* 198 m has been paved. What fraction of the path has not been paved yet? (3 quarters) *35 min*	Individual work, monitored, helped Drawn on BB or use enlarged copy master or OHP Reasoning, agreement, self-correction, praising

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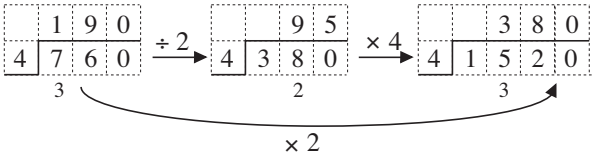
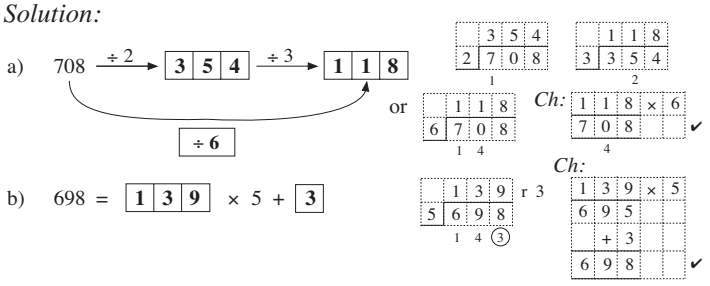
Bk4

Lesson Plan 15

Activity		*Notes*
6	***Book 4, page 15*** Q.3 Read: *Pete can cycle 4 m in one second. How long will it take Pete to cycle: a) 760 m, b) 380 m, c) 1520 m?* Set a time limit. Ps can use any correct form of calculation. Review at BB with whole class. Ps explain their solutions on BB. Who did the same? Who did it another way? etc. Mistakes discussed and corrected. *Solution:* e.g. a) 760 m b) 380 m c) 1520 m  190 seconds 95 seconds 380 seconds If no P has done so, T could elicit another way to obtain solutions to b) and c) using direct proportion. T draws arrows. Extra praise if Ps noticed relationships without hints from T. *40 min*	Individual work monitored, helped Differentiation by time limit Discussion, reasoning, agreement, self-correcting, praising or, e.g. 760 m ÷ 4 m = (400 m + 360 m) ÷ 4 m = 100 + 90 = 190 (times) Revise direct proportion. [If one value (i.e. dividend) increases (decreases) by a certain number of times, another value (i.e. quotient) also increases (decreases) by that number of times.]
7	***Book 4, page 15*** Q.4 Read: *Fill in the missing numbers and signs.* Ps do calculations and check with reverse operations at RHS of *Pbs* or in *Ex. Bks*.. Review at BB with whole class. Ps come to BB to fill in numbers and signs, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected. In a), agree that dividing by 2 and then by 3 is the same as dividing by 6. *Solution:*  *45 min*	Individual work monitored, helped (or whole class activity if time is short) Written on BB or use enlarged copy master or OHT Discussion, reasoning, agreement, self-correcting, praising or, e.g. 708 ÷ 2 = (600 + 108) ÷ 2 = 300 + 54 = 354 354 ÷ 3 = (300 + 30 + 24) ÷ 3 = 100 + 10 + 8 = 118 etc.

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Bk4

R: Mental calculation
C: Written calculations. Divisibility
E: Numbers up to 2000. Problems

Lesson Plan *16*

Activity		*Notes*
1	**Find the mistakes** *Mr. Silly* has done these calculations.! What do you think of them? Are they correct? How can we check? Could the layout be better? Ps come to BB to try to explain *Mr Silly's* reasoning, find any mistakes, say what he has done wrong and write the operation again correctly. Class agrees/disagrees. BB: e.g.	Whole class activity (Ps may do calculations in *Ex. Bks.* first if they wish) Written on BB or use enlarged copy master or OHP At a good pace Reasoning, agreement, praising Accept any form of correct calculation with correct reasoning.
	6 min	
2	**Number sets** Let's write the numbers from 0 to 20 in the correct place in the set diagrams. Deal with one part at a time. Ps come to BB one after the other to write a number, explaining reasoning. Class agrees/disagrees. BB: T points to each set in c). Ps say other numbers which belong there.	Whole class activity Drawn on BB or use enlarged copy master or OHP At speed Reasoning, agreement, praising T chooses Ps at random. Agreement, praising
	12 min	

a)

7	9	4	8			
−	7	0	0	1	0	0
	2	4	8			
−		7	0		1	0
	1	7	8			
−		7	0		1	0
	1	0	8			
−		7	0		1	0
		3	8			
	−	2	8			4
		1	0			
		−	7			1
			③	1	3	5

✔

Correct (but very long!)

Check:

1	3	5	×	7
9	4	5		
	+	3		
9	4	8		

b)

1	2	0	3
+	3	1	5
4	3	5	3

✗

315 has wrong place value!
Should be:

1	2	0	3
+	3	1	5
1	5	1	8

✔

d)

5	×	1	0	8
		0		
		4	0	
5	4	0		

✔

Correct result, but a better layout is:

1	0	8	×	5
	4	0		
	0			
5				
5	4	0		

c)

2	7	5	×	3
	1	5		
2	1			
6				
8	2	5		

✔

(long way)

e) $817 \div 8 = 12, \text{r } 1$ ✗

(0 tens missing)

Should be:

$817 \div 8 = 102, \text{r } 1$

Check:

		1	0	2	r 1
8	8	1	7		
−	8				
	0	1	7		
	−	1	6		
			①		

or

e) $817 \div 8$
$= 800 \div 8 + 17 \div 8$
$= 100 + 2. \text{ r } 1$
$= 102, \text{r } 1$

Feedback for T

a)

Divisible by 8	Not divisible by 8
0 8 16	1 2 3 4 5 6 7 9 10 11 12 13 14 15 17 18 19 20

b)

Divisible by 5	Not divisible by 5
0 5 10 15 20	1 2 3 4 6 7 8 9 11 12 13 14 16 17 18 19

c)

	Divisible by 8	Not divisible by 8
Not divisible by 5	8 16 *(48, 112)*	1 2 3 4 6 7 9 11 12 13 14 17 18 19 *(101, 533)*
Divisible by 5	0 *(40, 240)*	5 10 15 20 *(70, 95)*

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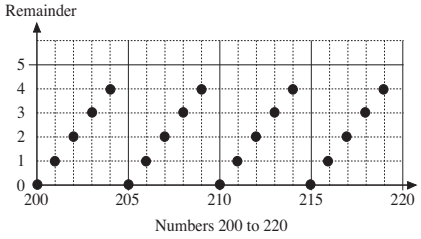
Bk4

Lesson Plan 16

Activity		*Notes*
3	**Problems** Listen carefully and think how you would work out the answer.	Whole class activity
	a) *How much will 8 bars of chocolate cost if 2 of the same bars cost £1.22?* Ps come to BB or dictate to T. Who agrees? Who would do it another way? etc. T summarises by writing out as below.	Initial discussion about different methods of solution. Involve several Ps.
	BB: 2 bars → £1.22 = 122 p 1 bar → 122 p ÷ 2 = 61 p 8 bars → 122 p ÷ 2 × 8 = 61 p × 8 = 488 p = £4.88	At a good pace Reasoning, agreement, praising T writes out again only if Ps have not done so clearly
	T highlights the combined operations as a one-line plan.	
	Or by using direct proportion: BB: × 4 (2 bars → 122 p; 8 bars → 488 p) × 4	If Ps do not suggest this way, T elicits or demonstrates it.
	Answer: 8 bars of chocolate will cost £4.88.	Ps say answer as a sentence.
	b) *How much will 9 packets of sweets cost if 3 of the same packets of sweets cost £3.06?* Who can write the operations in one line? Who can show it using direct proportion?	
	BB: 3 packets £3.06 = 306 p 9 packets 306 p ÷ 3 × 9 = 102 p × 9 = 918 p = £9.18	Reasoning, agreement, praising
	Or by using direct proportion: 9 packets are 3 times 3 packets, so will cost 3 times as much as 3 packets. BB: 306 p × 3 = 918 p = £9.18	
	Answer: 9 packets of sweets will cost £9.18.	Ps say answer as a sentence.
	20 min	
4	***Book 4, page 16*** Q.1 Read: *Write the numbers from 200 to 220 in the correct column in the table.* *Draw dots on the graph to show the remainders.*	Individual work, monitored, helped Drawn on BB or use enlarged copy master or OHP
	T (P) explains task. Do first two numbers with whole class first if Ps are unsure what to do. Review at BB with whole class. Ps come to BB one after the other to write a number in the table and show it in the graph. Class agrees/disagrees. Mistakes discussed and corrected. *Solution:*	Discussion, reasoning, agreement, self-correcting, praising Why are there no dots on the remainder 5 line? (e.g. Because if you had a remainder of 5 you would be at the next multiple of 5 whichis already shown on the line for remainder 0.)
	27 min	

Remainder after dividing by 5				
0	1	2	3	4
200	201	202	203	204
205	206	207	208	209
210	211	212	213	214
215	216	217	218	219
220				



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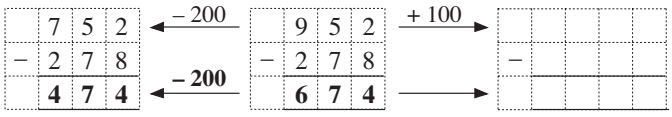
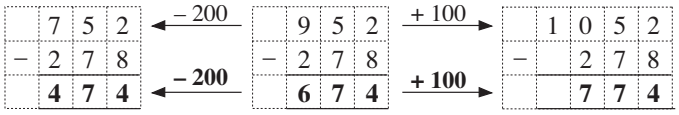
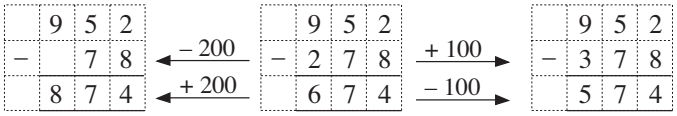
Bk4

Lesson Plan 16

Activity		*Notes*
5	***Book 4, page 16, Q.2*** Read: *Helen had 952 stamps. She gave 278 stamps to Sam.* a) *How many stamps did Helen have left? Complete the calculation.* Ps come out to BB to point to relevant data and complete the middle subtraction, explaining reasoning. Class agrees/disagrees. Ps write the result in *Pbs* too. BB: Read: b) *How many stamps would she have left if she had at first* *i) 200 stamps less?* Which calculation is this? Should we follow the arrows pointing to the right or to the left? Ps come to BB to point to relevant arrows, to write the LH subtraction, explaining reasoning and to write operation above lower arrow. Class agrees/disagrees. Ps write the result in *Pbs*. BB:  Read: b) *How many stamps would she have left if she had at first* *ii) 100 stamps lmore?* Ps come to BB to point to relevant arrows, to write the subtraction, on RHS, explaining reasoning and to write operation above lower arrow. Class agrees/disagrees. Ps write the result in *Pbs* too. *Solution:*  	Whole class activity Drawn on BB or use enlarged copy master or OHP At a good pace Reasoning, agreement, praising Extra praise if Ps realise that only one subtraction needs to be done properly – the other results can be obtained mentally.
Extension	*How many stamps would Helen have left if she had given Sam:* *i) 200 less stamps* *ii) 100 more stamps?* Ps come to BB to write calculations and operations above arrows. Class agrees/disagrees. BB:  	Drawn on BB or use enlarged copy master or OHP Reasoning, agreement, praising (Or Ps calculate mentally and show results to T on scrap paper or slates in unison on command.)

33 min

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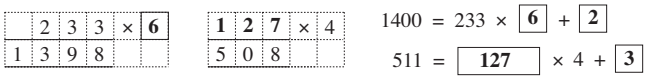
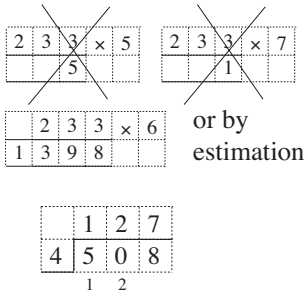
Bk4

Lesson Plan 16

Activity		*Notes*
6	***Book 4, page 16*** Q.3 Read: *Fill in the missing numbers*. Set a time limit. Ps can write necessary calculations in *Ex. Bks*. Remember to check your result by doing the completed calculation again mentally. Review at BB with whole class. Ps come to BB or dictate results to T, explaining how they worked out the answer. Who agrees? Who did it a different way? etc. (e.g. using reverse calculation or trial and error or noticing connections or by estimation.) If problems, show details of reverse calculation on BB. Mistakes discussed and corrected. *Solution:* a) b)  *39 min*	Individual work, monitored, helped Written on BB or use enlarged copy master or OHP Differentiation by time limit Discussion, reasoning, agreement, self-correction, praising Details, e.g.trial and error:  or by estimation
7	***Book 4, page 16, Q.4*** T (or P) reads questions and Ps work out answers mentally (or in *Ex. Bks*. if necessary) then show on scrap paper or slates on command. Ps who respond correctly explain to those who do not. T writes agreed result on BB. *3 pupils can do 108 multiplication in 3 hours. If all the pupils calculate at the same speed, how many calculations can be done by:* a) *6 pupils in 3 hours* (216) $2 \times 108 = \underline{216}$ b) *3 pupils in 6 hours* (216) $2 \times 108 = \underline{216}$ c) *6 pupils in 6 hours* (432) $2 \times 2 \times 108 = 4 \times 108 = \underline{432}$ d) *6 pupils in 9 hours* (648) $2 \times 3 \times 108 = 6 \times 108 = \underline{648}$ e) *9 pupils in 9 hours* (972) $3 \times 3 \times 108 = 9 \times 108 = \underline{972}$ f) *3 pupils in 90 minutes* (54) $108 \div 2 = \underline{54}$ g) *6 pupils in 90 minutes* (108) $108 \times 2 \div 2 = \underline{108}$ h) *9 pupils in 90 minutes* (162) $108 \times 3 \div 2 = 324 \div 2 = \underline{162}$ i) *1 pupil in 3 hours* (36) $108 \div 3 = (90 + 18) \div 3 = \underline{36}$ j) *1 pupil in 1 hour?* (12) $108 \div 3 \div 3 = 36 \div 3 = \underline{12}$ ***45 min***	Whole class activity (or individual work under a time limit if Ps wish, reviewed with whole class) Written on BB or use enlarged copy master or OHP Responses shown in unison Reasoning, agreement, praising Extra praise if Ps notice relationships which make calculations easier, e.g. d) → 3 × a) g) → 2 × f) h) → 3 × f) j) → f) ÷ 3 Stand up if you had all correct! Let's give them '3 cheers'!

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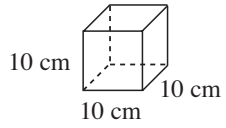
Bk4

R: Calculation
C: Measures: revision of length, capacity, mass. Numbers up to 2000
E: Problems

Lesson Plan *17*

Activity		*Notes*
1	**Measuring length** a) What units does your ruler show? (e.g. cm and mm) What range of lengths can you measure with it? (e.g. 0 cm to 27 cm or 0 mm to 275 mm; or more if we mark, e.g. 20 cm, then move the ruler along) Who can fill in the missing items? Ps come to BB or dictate to T. BB: 1 centimetre = [10] millimetres 1 cm = 10 [mm] Measure the width of your exercise book. T asks several Ps their result. Ps might give it in different units. T writes on BB. e.g. BB: Width of exercise book: 18 cm 5 mm = 185 mm b) i) What range of lengths can we measure with this metre stick? (0 m to 1 m, or 0 cm to 100 cm, or 0 mm to 1000 mm) ii) What range of lengths can we measure with this tape measure? (e.g. 0 m to 1 and a half m, or 0 cm to 150 cm, or 0 mm to 1500 mm) Let's measure the width of **A**'s desk (the classroom). Ps come to front of class in pairs to choose an appropriate measuring tool, measure and write length on BB. (T should have an idea of what the lengths are beforehand. If the measures are way out, ask another pair of Ps to repeat it.) e.g. BB: Width of: A's desk: 503 mm = 50 cm 3 mm the classroom: 1245 cm = 12 m 45 cm (= 12 450 mm) Who can fill in the missing items? Ps dictate to T or come to BB. Rest of class write in *Ex. Bks.* too. BB: 1 m = 100 [cm] = [1000] mm 1 km = [1000] m 1 cm = [10] mm What place is about 1 km from the school? (T should already have one or two in mind, or cite number of times round playground) *10 min*	Whole class activity Ps have rulers on desks and T has other measuring tools (e.g. metre rule, tape measure, etc.) (T could have a ruler or tape measure in inches and feet too and compare these Imperial units with cm and m.) Discussion, agreement, praising At a good pace throughout And/or T could ask several Ps how tall they are (or measure them) and write their heights on BB. **Extension** [T might mention that in some countries, e.g. Hungary, they use these units of length. BB: 1 mm < 1 cm < 1 dm < 1 m < 1 km ×10 ×10 ×10 ×1000 What do you think dm means? (decimetre) How many cm do you think are in 1 dm? (10) How many dm do you think are in 1 m? (10). Elicit or tell that 1 dm = 1 tenth of a m]
2	**Measuring capacity** What is capacity? (How much liquid a container can hold.) a) Let's measure capacity using non-standard units. (e.g. measuring the capacity of a jug or bottle using a tumbler or glass.) Ps estimate first, then confirm by measuring with water. e.g. BB: 3 glasses < capacity of jug < 4 glasses b) What range of capacity can be measured using this measuring jug (feeding bottle)? e.g. 0 ml to 1000 ml, or 0 cl to 100 cl, or 0 litre to 1 litre. How much water is in this bucket (bottle, etc.)? Ps estimate first, then measure. (e.g. 2 litres, 75 cl, 750 ml, etc.) What is missing? Ps come to BB or dictate to T. BB: 1 litre = 100 [cl] = [1000] ml 1 cl = 10 [ml] Ps copy in *Ex. Bks.* Elicit the relationship between capacity and length. Show it in a diagram or demonstrate with an open-top 10 cm glass cube. *20 min*	Whole class acivity T has various containers of different size Discussion, agreement, praising At a good pace T could mention Imperial units too (pint, gallon) and compare with decimal units. BB: 1 litre of water  **Extension** How many litres of water would you displace in a bath?

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Bk4		*Lesson Plan 17*
Activity		***Notes***
3	**Measuring mass** T has various objects to weigh and different sets of scales and weights. a) Ps come to front of class to measure weights using non-standard units. Ps estimate first. e.g. 2 spoons < a book < 3 spoons b) What range of units could we measure with these scales? Ps come to BB ro read range and T writes on BB. (e.g. 0 g to 1000 g, or 0 kg to 5 kg) Ps come to front to estimate mass first then weigh various items using appropriate sets of scales and standard units. Ps write weights on BB. T could ask various Ps what they weigh, or Ps come to front of class to weigh themselves on bathroom scales and write weights on BB. What is missing? Ps come to BB or dictate to T. BB: 1 kg = $\boxed{1000}$ g 1 tonne = 1000 $\boxed{\text{kg}}$ Ps copy in *Ex. Bks*. What kind of things would you weigh in tonnes? (e.g. ships, elephants, transporters, etc. – very heavy things!) Elicit the relationship between mass, capacity and length. Ps can demonstrate by filling a 10 cm × 10 cm × 10 cm open-top glass cube with water, pouring it into a litre jug, then pouring it into the container on a set of scales. BB: 1000 cm cubes (cc) of water → 1 litre → 1 kg 1 cc of water → 1 ml → 1 g *28 min*	Whole class activity Digital and mechanical scales and balances with various weights: e.g. 1 g, 2 g, 5 g, 10 g, 20 g, 50 g, 100 g, 200 g, 500 g, 1 kg [T might show Imperial weights too (ounce, lb, stone) and compare with decimal measures.] At a good pace Discussion, agreement, praising Allow Ps to explain it if they can but T should have appropriate measuring tools available for them to use. T gives hints only if Ps do not remember. Agreement, praising
4	***Book 4, page 17*** Q.1 Read: *Fill in the missing numbers and units*. What kind of measures are these? (length) Set a time limit. Review at BB with whole class. Ps dictate results to T or come to BB, explaining reasoning. Mistakes discussed and corrected. *Solution:* a) 3 m 35 cm = 335 cm b) 5 m 70 cm = 570 cm c) 198 cm = 1 m 98 cm d) 609 cm = 6 m 9 cm e) 8 cm 4 mm = 84 mm f) 1 m 32 cm 5 mm = 1325 mm g) 1273 mm = 1 m 27 cm 3 mm h) 1905 mm = 1 m 90 cm 5 mm *32 min*	Individual work, monitored, helped Written on BB or use enlarged copy master or OHP Differentiation by time limit Discussion, reasoning, agreement, self-correcting, praising Feedback for T
5	***Book 4, page 17*** Q.2 Read: *Fill in the missing numbers and units*. What kind of measures are these? (capacity) Set a time limit. Review at BB with whole class. Ps dictate results to T or come to BB, explaining reasoning. Mistakes discussed and corrected. *Solution:* a) 3 litres 42 cl = 342 cl b) 6 litres 58 cl = 658 cl c) 824 cl = 8 litres 24 cl d) 703 cl = 7 litres 3 cl e) 1 litre 63 cl 5 ml = 1635 ml f) 1 litre 4 cl 8 ml = 1048 ml g) 1546 ml = 1 litre 54 cl 6 ml h) 1038 ml = 1 litre 3 cl 8 ml *36 min*	Individual work, monitored, helped Written on BB or use enlarged copy master or OHP Differentiation by time limit Discussion, reasoning, agreement, self-correcting, praising Feedback for T

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Bk4

Lesson Plan 17

Activity		***Notes***
6	***Book 4, page 17*** Q.3 Read: *Fill in the missing numbers and units.* What kind of measures are these? (mass) Set a time limit. Review at BB with whole class. Ps dictate results to T or come to BB, explaining reasoning. Mistakes discussed and corrected. *Solution:* a) 1 kg 806 g = 1806 g b) 1 kg 257 g = 1257 g c) 1300 g = 1 kg 300 g d) 1604 g = 1 kg 604 g e) 1320 g = 1 kg 320 g f) 1001 g = 1 kg 1 g g) 1624 g = 1 kg 624 g h) 1479 g = 1 kg 479 g *40 min*	Individual work, monitored, helped Written on BB or use enlarged copy master or OHP Differentiation by time limit Discussion, reasoning, agreement, self-correcting, praising Feedback for T
7	***Book 4, page 17, Q.4*** Read: *Write plans and do the calculations in your exercise book. Fill in the answers.* Deal with one part at a time. P reads question aloud, 2nd P writes a plan, 3rd P does calculation, 4th P checks it and 5th P says the answer as a sentence. Throughout, rest of class intervenes if an error is made or if they think of an alternative way to solve it. *Solution:* e.g. a) F*reddy Frog jumped 120 cm 5 mm, then another 1 m 14 cm 3 mm. How far did he jump altogether?* *Plan:* 1st jump: 120 cm 5 mm = 1205 mm 2nd jump: 1 m 14 cm 3 mm = 1143 mm Total distance jumped: 1205 + 1143 = 2348 (mm) 2347 mm = 2 m 347 mm = 2 m 34 cm 7 mm *Answer:* He jumped 2 m 34 cm 8 mm altogether. b) *Peter Pelican drank 1 litre of 143 ml of water and his son drank 210 ml less. How much water did his son drink?* *Plan:* P: 1 litre 143 m = 1143 ml S: 1143 ml – 210 ml *Answer:* His son drank 933 ml (= 93 cl 3 ml) of water. c) *If one egg weighs 60 g, what is the weight of 31 eggs?* *Plan:* 1 egg: 60 g 31 eggs: 31 × 60 g *C:* 31 × 60 g = 30 × 60 g + 60 g = 1800 g + 60 g = 1860 g 1860 g = 1 kg 860 g *Answer:* 31 eggs weigh 1 kg 860 g. d) *Sammy Snail takes 5 minutes to move 1950 mm. How far can he move in 1 minute?* *Plan:* 5 min: 1950 mm 1 min: 1950 mm ÷ 5 *C:* 1950 ÷ 5 = 390 (mm) 390 mm = 39 cm *Answer:* He can move 39 cm in 1 minute. *45 min*	Whole class activity (or individual work if Ps wish, reviewed with whole class) Discussion, agreement, checking, praising or 120 cm = 1 m 20 cm 1 m 20 cm 5 mm + 1 m 14 cm 3 mm = (1 + 1) m + (20 + 14) cm + (5 + 3) mm = 2 m + 34 cm + 8 mm *C:* 1143 − 210 = 933 (ml) or 31 × 60 = 31 × 6 × 10 = 186 × 10 = 1860 or 1950 ÷ 5 = 1000 ÷ 5 + 500 ÷ 5 + 450 ÷ 5 = 200 + 100 + 90 = 390 (mm)

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Bk4	R: Calculations **C: Measures: (length, capacity,mass, time). Numbers up to 2000** *E: Problems*	*Lesson Plan* *18*
Activity		***Notes***
1	**Estimating length** Imagine these things in real life. Estimate their lengths. BB: ⓐ book ⓑ rubber ⓒ house ⓓ car ⓔ table 1 m < **e** < 2 m 2 cm **b** < 3 cm 10 cm < **a** < 20 cm 4 m < **d** < 5 m 10 m < **c** < 20 m Ps come to BB to write letter of item in appropriate inequality. Class agrees disagrees. If problems, check against real measures. *4 min*	Whole class activity (T could have some real items to show to class) Inequalities written on BB or use enlarged copy master or OHP At a good pace Agreement, praising Feedback for T
2	**Estimating capacity** Imagine these things in real life. Estimate their capacity BB: ⓐ jug ⓑ bucket ⓒ tank ⓓ spoon ⓔ glass ⓕ bottle 1 litre < **f** < 2 litres 80 litres < **c** < 100 litres 10 ml < **d** < 20 ml 100 ml < **e** < 200 ml 800 ml < **a** < 1000 ml 1000 cl < **f** < 2000 cl 5 litres < **b** < 10 litres 80 cl < **a** < 1 litre Ps come to BB to write letter of item in appropriate inequality. Class agrees disagrees. Extra praise if Ps notice that 2 inequalities are the same as two others (see joining lines). *10 min*	Whole class activity (T could have some real items to show to class.) Inequalities written on BB or use enlarged copy master or OHP At a good pace Discussion, agreement, praising T points to other inequalities Ps say them using other units, e.g 10 cl < **e** < 20 cl
3	**Estimating mass** Imagine these things in real life. Estimate their mass (weight). BB: ⓐ 1 litre of milk ⓑ apple ⓒ teacher ⓓ loaf of bread ⓔ Y4 boy ⓕ egg 900 g < **a** < 1100 g 20 kg < **e** < 40 kg 50 g < **f** < 100 g 50 kg < **c** < 1000 kg 500 g < **d** < 1000 g 100 g < **b** < 200 g Ps come to BB to write letter of item in appropriate inequality. Class agrees disagrees. *15 min*	Whole class activity (T could have real items to show to class.) Inequalities written on BB or use enlarged copy master/OHP At a good pace Discussion, agreement, praising **Extension** Ps suggest another item and class agrees on an inequality for it. Check with real weight.

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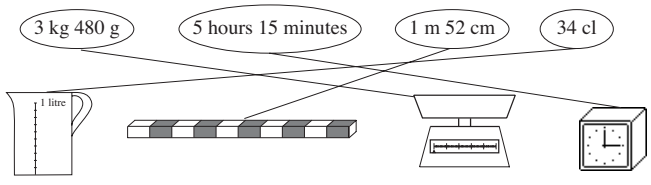
Bk4

Lesson Plan 18

Activity		*Notes*
4	**Time** What standard units of time do we use? Ps tell what they know. (e.g. seconds, minutes, hours, days, weeks, months, seasons, years) Let's fill in the missing units. Ps come to BB or dictate to T. BB: 1 year = **4** seasons 1 year = 52 **weeks** + 1 or 2 **days** 1 year = 12 **months** 1 week = **7** days 1 **year** = 365 or 366 **days** 1 day = 24 **hours** 1 hour = **60** minutes 1 minute = 60 **seconds** T informs class (or elicits if T thinks Ps might know): • Leap years have an extra day (February 29th) so have 366 days. • Years divisible by 4 are leap years, except the whole hundred years when only every fourth hundred is a leap year. When is the next leap year? (2004, as the next year divisible by 4) • In a non-leap year, 1 January and 31 December are on the same day of the week. • The year 2000 was the last year of the second millennium (or second thousand years), or the last day of the 20th century. • 2001 is the first year of the third millennium (or third thousand years), or the first year of the 21st century. What was the first day of the 21st century? (1 January 2001, or 01 / 01 / 2001) *20 min*	Whole class activity T has clock and large calendar on the wall. Written on BB or use enlarged copy master or OHP At a good pace Agreement, praising BB: 52 × 7 = 350 + 14 = 364 Feedback for T Discussion. Involve several Ps. e.g. 2000 was a leap year but 2100 will not be. T refers to calendar where appropriate. BB: 1 century = 100 years 1 millennium = 1000 years Remind Ps of different ways of writing the date.
5	**What is the time?** a) T sets a real or model clock and Ps read the time. Encourage other Ps to express the times in different ways. e.g. 12 o'clock, 12:00 or 00:00, mid-day (noon) or midnight 4 o'clock, 4.00 pm or 4.00 am, 04:00 or 16:00 2 minutes to nine, 8.58 am or 8.58 pm, 8:58 or 20:58 A quarter to 12, 11.45 am or 11.45 pm, 11:45 or 23:45, etc. b) T (or P) dictates times in different ways. Ps set their model clocks and show to T on command. *25 min*	Whole class activity T chooses Ps at random. Class points out errors. Remind Ps that 12 o'clock is neither am nor pm. Agreement, praising Ps can set the time too! Use copy master from *Y2 LP 83/1*. Agreement, praising
6 **Extension**	***Book 4, page 18*** Q.1 Read: *Join up the quantities to the tools you would use to measure them.* Review at BB with whole class Ps come to BB to draw joining lines. Class agrees/disagrees. Mistakes discussed and corrected. *Solution:*  T points to a quantity and Ps express it in another way. *29 min*	Individual work, monitored Drawn on BB or use enlarged copy master or OHP Discussion, agreement, self-correcting, praising Feedback for T e.g. 3 kg 480 g = 3480 g Agreement, praising

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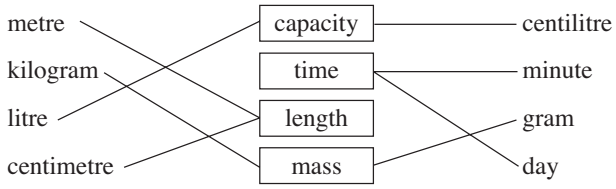
Bk4

Lesson Plan 18

Activity		*Notes*
7	***Book 4, page 18*** Q.2 Read: *Join up the measures to the matching units.* Review at BB with whole class Pscome to BB to draw joining lines. Class agrees/disagrees. Mistakes discussed and corrected. *Solution:*  	Individual work, monitored Written on BB or use enlarged copy master or OHP Discussion, agreement, self-correcting, praising Feedback for T
Extension	What other units could be used for each type of measure?	e.g. capacity: ml (pint, gallon)
	33 min	
8	***Book 4, page 18*** Q.3 Read: *Fill in the missing numbers and units.* Elicit that there are 14 equations. Set a time limit. Review at BB with whole class. Ps come to BB or dictate to T. Ps mark/correct own work and write how many correct out of 14. Who had 14 correct? Who made 1 mistake (2, 3, 4, more than 4) mistakes? What was your mistake? Who did the same? Who made a different mistake? etc. *Solution:* a) 439 cm = 4 m 39 cm — 12 m 6 cm = 1206 cm b) 1831 mm = 1 m 83 cm 1 mm — 1 m 67 mm = 1067 mm c) 1210 g = 1 kg 210 g — 1 kg 340 g = 1340 g d) 1942 ml = 1 litre 942 ml — 1 litre 86 ml = 1086 ml e) 11 minutes = 660 seconds — 4 hrs 27 min = 267 min f) 372 seconds = 6 m 12 sec — 10 min 40 sec = 640 sec g) January = 4 weeks 3 days — June = 4 weeks 2 days	Individual work, monitored, helped Written on BB or use enlarged copy master or OHP Differentiation by time limit Reasoning, agreement, self-correction, praising Evaluation. Class applauds Ps with all (most) correct. Feedback for T
	40 min	
9	***Book 4, page 18*** Q.4 Read: *Write in the missing numbers. (They need only be approximate.)* Ps fill in what they can during the rest of the lesson. They can finish it at home if they run out of time. T chooses Ps to read out their details. Class decides whether their estimates are realistic or not. *Solution:* e.g. Today's date: 16 / 10 / 2001 My height: 134 cm = 1 m 34 cm My weight: 32 kg — Length of my step: 60 cm My age: 8 years 3 months — Length of my span: 12 cm I go to bed at: 9.00 pm — Length of my foot: 14 cm I get up at: 8.00 am — I sleep for: 11 hours per day	Individual work, monitored Ps have rulers on desks. T should have bathroom scales and a height measure against the classroom wall. T might need to explain what a 'span' is (from tip of thumb to tip of little finger when hand is stretched out flat) Ps can help each other to find the measures they do not know. Agreement, self-correcting, praising, encouragement only In good humour!
	45 min	

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Bk4

R: Calculations up to 1000

C: Length, capacity, mass, time. Calculations up to 2000

E: Problems

Lesson Plan *19*

Activity

1

Problems

Study the diagrams and the data. Let's think of questions to ask and then try to answer them. Ps suggest questions and methods of solution.

a) BB:

[N.B. Choose easier lengths for sides if T does not want class challenged so much!]

e.g.

Q.1 *What is the perimeter of the rectangle?*

$P = 2 \times (2\text{ m} + 3\text{ m }42\text{ cm}) = 2 \times 5\text{ m }42\text{ cm}$

$= \underline{10\text{ m }84\text{ cm}}$

Q.2 *Which side is longer and by how much?*

Let's label the long side a and the short side b.

$a = 3\text{ m }42\text{ cm} = 342\text{ cm}$

$b = 2\text{ m} = 200\text{ cm}$, so $\underline{a > b}$

$a - b = 342\text{ cm} - 200\text{ cm} = 142\text{ cm} = \underline{1\text{ m }42\text{ cm}}$

Answer: a is longer than b by 1 m 42 cm

Q.3 *What is the area of the rectangle?*

$A = 3\text{ m }42\text{ cm} \times 2\text{ m} = 3\text{ m} \times 2\text{ m} + 42\text{ cm} \times 2\text{ m}$

$= 6\text{ m}^2 + 42\text{ cm} \times 200\text{ cm}$

$= 6\text{ m}^2 + 8400\text{ cm}^2$

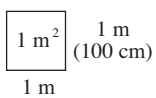
$= \underline{6\text{ m}^2\ 8400\text{ cm}^2}$

or $A = 342\text{ cm} \times 200\text{ cm} = 684\text{ cm} \times 100\text{ cm} = 68\,400\text{ cm}^2$

$= \underline{6\text{ m}^2\ 8400\text{ cm}^2}$

Because

BB:



$1\text{ m} \times 1\text{ m} = 1\text{ m}^2$ (1 m square)

$1\text{ cm} \times 1\text{ cm} = 1\text{ cm}^2$ (1 cm square)

$1\text{ m}^2 = 100 \times 100\text{ cm}^2 = \underline{10\,000\text{ cm}^2}$

b) BB: ⚽⚽⚽⚽⚽⚽⚽⚽⚽⚽⚽⚽ → £13 20 p

⚽⚽⚽

e.g.

Q.1 *What do 3 balls cost?*

12 balls: £13 20 p = 1320 p

3 balls: 1320 p ÷ 12 × 3 = 110 p × 3 = 330 p = £3 30 p

Or 3 balls = 12 balls ÷ 4, so cost is 1320 p ÷ 4 = 330 p

Of course, Ps might think of questions not mentioned here!

10 min

Notes

Whole class activity

Diagrams drawn on BB

T intervenes only if necessary.

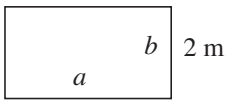
Ps draw diagrams and write solutions in *Ex. Bks.* too.

Reasoning, agreement, praising

or 2 × 5 m 42 cm

= 2 × 542 cm = 1084 cm

BB:



This is very difficult because of the data, but if Ps suggest it let them work through it as far as they can, praising any correct contribution.

T helps with the calculation and reading the result.

T reminds Ps of the notation for 'squares' and explains why 68 400 cm² = 6 m² 8400 cm²

Have no expectations of Ps learning it yet, but some might follow the reasoning!

C:

			1	1	0
1	2	1	3	2	0
	–	1	2		
			1	2	
		–	1	2	
				0	0

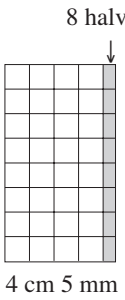
or

		3	3	0
4	1	3	2	0
		1		

330 p = £3 30 p = £3.30

Bk4

Lesson Plan 19

Activity		*Notes*
2	**Construction** a) Draw a rectangle in your *Ex. Bks* with sides 4 cm 5 mm and 8 cm. T draws a rough diagram on BB but Ps measure (or count) accurately in *Ex. Bks* or on grid. b) Calculate its perimeter and its area. T sets a time limit. Review at BB with whole class. Ps come to BB or dictate to T. Class agrees/disagrees. Mistakes discussed and corrected. T helps throughout. BB:  *Solution:* by calculating in either mm or cm (or by counting) $P = 2 \times (45\text{ mm} + 80\text{ mm}) = 2 \times 125\text{ mm} = 250\text{ mm} = \underline{25\text{ cm}}$ or $P = 2 \times (4.5\text{ cm} + 8\text{ cm}) = 2 \times 12.5\text{ cm} = \underline{25\text{ cm}}$ $A = 45\text{ mm} \times 80\text{ mm} = \underline{3600\text{ mm}^2}$, or $A = 4.5\text{ cm} \times 8\text{ cm} = (32 + 4)\text{ cm}^2 = \underline{36\text{ cm}^2}$ 4 5 × 8 3 6 0 4 *18 min*	Individual work in *Ex. Bks* (or on 0.5 cm square grid) monitored, helped Perimeter found individually but area could be done with the whole class. Reasoning, agreement, self-correction, praising Elicit that: 45 mm = 4.5 cm 4.5 = 4 and 5 tenths = 4 and a half BB: 1 mm × 1 mm = 1 mm^2 10 mm × 10 mm = 100 mm^2 = 1 cm^2
3	**Missing numbers and units** Let's see how quickly we can fill in the missing items! Ps come to BB to write numbers and units, explaining reasoning and to say completed equation. Class checks mentally whether they are correct. BB: a) 780 m + **220 m** = 1 km 2 km – **500** m = 1500 m 1260 m + **740 m** = 2 km 1 km – **560** m = 440 m b) 450 g + **550 g** = 1 kg 1 kg – 20 g = **980** g 1350 m + **650 g** = 2 kg 2 kg – 840 g = **1160** g c) 330 ml + **670 ml** = 1 litre 1 litre – **590** ml = 410 ml 1600 ml + **400 ml** = 2 litres **1310** ml – 1 litre = 310 ml *25 min*	Whole class activity Written on BB or SB or OHT or use enlarged copy master At a good pace Reasoning, e.g. '780 m + 220 m = 1 km because 1 km – 780 m = 220 m' Agreement, praising
4	***Book 4, page 19*** Q.1 Read: *Fill in the missing numbers.* Set a time limit or deal with one row at a time. Review at BB with whole class. Ps come to BB or dictate to T, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected. *Solution:* a) 1500 m = 1 km 500 m 1 km 480 m = 1480 m b) 1300 g = 1 kg 300 g 1 kg 290 g = 1290 m c) 1640 mm = 1 m 640 mm 1 m 517 mm = 1517 mm d) 1240 ml = 1 litre 240 ml 1 litre 804 ml = 1804 ml e) 640 minutes = 10 hrs 40 min 10 hrs 56 min = 656 min f) 90 days = 12 weeks 6 days 50 wks 6 days = 356 days *31 min*	Individual work, monitored, helped Written on BB or use enlarged copy master or OHP Discussion, reasoning, agreement, self-correction, praising Feedback for T

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Bk4

Lesson Plan 19

Activity		*Notes*
5	***Book 4, page 19*** Q.2 Elicit that there are 3 × 4 = 12 additions and subtractions. Ps can calculate horizontally in *Pbs* or vertically in *Ex. Bks*. Deal with one block at a time. Set a time limit. Review at BB with whole class. Ps come to BB or dictate to T, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected. *Solution:* a) 340m + 460m = 740 m + 60 m = 800 m 950 m + 320 m = 1250 m + 20 m = 1270 m = 1 km 270 m 1 km 50 m + 406 m = 1 km 456 m 1 km 240 m – 1040 m = 1240 m – 1040 m = 200 m b) 810 ml + 190 ml = 1000 ml = 1 litre 450 ml + 870 ml = 1320 ml = 1 litre 320 ml 1 litre 310 ml + 440 ml = 1 litre 750 ml 1 litre 50 ml – 200 ml = 1050 ml – 200 ml = 850 ml c) 157 g + 243 g = 357 g + 43 g = 400 g 630 g + 510 g = 1140 g = 1 kg 140 g 1 kg 40 g + 350 g = 1 km 390 g 1 kg 210 g – 430 g = 1210 g – 430 g = 780 g	Individual work, monitored, helped Written on BB or use enlarged copy master or OHP Differentiation by time limit Reasoning, agreement, self-correction, praising Deails of vertical calculations written on BB if needed, e.g. c) | | 6 | 3 | 0 | | + | 5 | 1 | 0 | | 1 | 1 | 4 | 0 | | 1 | 2 | 1 | 0 | | – | 4 | 3 | 0 | | | 7 | 8 | 0 |
	40 min	
6	***Book 4, page 19, Q.3*** Read: *Fill in the missing numbers to show how much time has passed.* How could we do it? (e.g. using a model clock) Ps come to front of class to set the initial time on the model clock and then to move it forward to the finish time. Class counts the hours and minutes. P writes the time passed on the BB and Ps in *Pbs*. What other way could we have worked it out? (subtraction) Who would like to show it on the BB? Ps writes subtraction, wi th T's help. BB: a) 12 hours 15 min – 7 hours 45 min = 5 hours 15 min – 45 min = 5 hours – 30 min = 4 hours 30 min T shows another model: 12 hrs 15 min → 11 hrs 75 min – 7 hrs 45 min – 7 hrs 45 min 4 hrs 30 min Ps come to BB to use whichever method they prefer to work out the missing times, explaining reasoning (with T's help if necessary). Class points out errors or easier ways to calculate. *Solution:* a) 7 hours 45 min to 12 hours 15 min: 4 hours 30 min b) 15 hours 30 min to 17 hours 50 min: 2 hours 20 min c) 6.30 am to 2.40 pm: 8 hours 10 min d) 08 : 40 : 00 to 15 : 10 : 00: 6 hours 30 min e) 10 : 25 : 00 to 14 : 40 : 00: 4 hours 15 min f) 2 : 10 : 00 to 3 : 20 : 00: 1 hour 10 min	Whole class activity (if some Ps wish to try it individually, let them) Written on BB or SB or use enlarged copy master or OHT Discussion on methods of solution (e.g. practically, or 'counting on' or subtraction) Ps might start vertical subtraction, then need T"s help to complete it. Reasoning, agreement, praising c) 2.40 pm → 14 hrs 40 min 6.30 am → 6 hrs 30 min Difference: 8 hrs 10 min d) 15 hrs 10 min → 14 hrs 70 min – 8 hrs 40 min – 8 hrs 40 min 6 hrs 30 min
Extension	T points to a time and Ps express it in another way.	f) if both are am or both pm!
	45 min	

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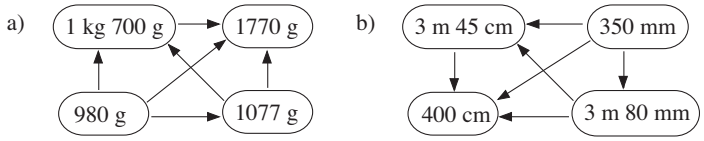
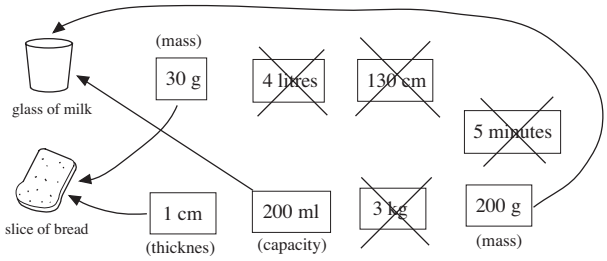
Bk4	R: Mental calculation **C: Measurement: time** *E: Numbers up to (and beyond) 2000*	*Lesson Plan* *20*
Activity		***Notes***
1	**Which is more?** Let's compare them and draw arrows pointing towards the one which is more. Ps come to BB to draw arrows. Class points out errors. BB:  What do you notice? (e.g. 6 arrows, 3 pointing towards the biggest quantity, 2 towards the 2nd biggest, 1 towards the 2nd smallest; the smallest quantity has only arrows pointing away from it) *5 min*	Whole class activity Written on BB or flash cards stuck to BB, or use enlarged copy master or OHP At a good pace In good humour! Reasoning, agreement, praising Feedback for T
2	**Which belongs?** Which of these quantities belongs to which food ? Ps come to BB to draw joining lines or to cross out unrealistic quantities, explaining reasoning. Class agrees/disagrees. BB:  (Ps might say, e.g., that they can eat a slice of bread or drink a glass of milk in 5 minutes; or that in Giant's Land a glass could hold 4 litres of milk and a slice of bread could weigh 3 kg and measure 130 cm long!) *10 min*	Whole class activity Drawn on BB or use pictures cut from magazines and cards stuck to BB, or use enlarged copy master or OHP At a good pace Reasoning, agreement, praising In good humour! If possible, confirm with real glass of milk and slice of bread. Extra praise if Ps make a valid case for one of the quantities crossed out.
3	**Time** Write the answers to these questions in your *Ex. Bks*. Use suitable units of time. The times need only be approximate or you could give a range if you are unsure. Review answer after every question. Deal with all cases. a) How long do you sleep each day? (e,g. 8 to 11 hours) b) How long is the school's Easter break? (e.g. 2 weeks) c) How long is half a year? (e.g. 6 months; 26 weeks; 182 and a half days) d) How much time does it take you to get to school? (various answers) e) How long is your maths lesson? (e.g. 45 minutes; 3 quarters of an hour) f) How much time does it take you to run 100 m? (e.g. 20 seconds, half a minute, etc.) Ps can think of question too! *15 min*	Individual work in *Ex. Bks* but class kept together Or Ps could show answers on scrap paper or slates in unison on command. Discuss whether aswers are realistic or unrealistic. In f) T could have a rough distance measured beforehand to give Ps an idea, e.g. from the school gate to the playing fields. Extra praise for clever questions!

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Bk4

Lesson Plan 20

Activity		*Notes*
4	***Book 4, page 20***	Individual work, monitored, helped
	Q.1 Read: *Write a plam. Do the calculation in your exercise book. Write the answer*	(starred questions can be done with whole class if T thinks they are too difficult)
	Deal with one part at a time. Ps read question themselves, write a plan in *Pbs*, do calculation in *Ex. Bks*. and write answer in *Pbs*.	Reasoning, agreement, self-correction, praising
	Review with whole class. T asks several Ps for their answer. **A**, come and tell us how you worked it out. Who did the same? Who did it a different way? etc. Mistakes discussed/corrected.	
	Solution:	
	∗ a) *A ball bearing weighs 30 g. What is the weight of 451 ball bearings?*	
	Plan: 30 g × 451 *C:* 30 × 451 = 3 × 4510 = 13 530 (g) = <u>13 kg 530 g</u>	
	Answer: They weigh 13 kg 530 g.	
	b) *A snail moves at a speed of 6 cm per minute. How far will it have gone after 3 hours 7 minutes?*	
	Plan: (3 × 60 + 7) × 6 cm *C:* 187 × 6 cm = 1122 cm = <u>11 m 22 cm</u>	
	Answer: It will have gone 11 m 22 cm.	
	∗ c) *Grandma made 17 litres of tomato sauce and poured it into 70 cl bottles. How many bottles did she fill?*	
	Plan: (17 × 100) cl ÷ 70 cl *C:* 1700 ÷ 70 = 170 ÷ 7 = <u>24, r 2</u>	
	Answer: She filled 24 bottles.	
	d) *Mum bought 14 m 36 cm of material and made 4 tablecloths, all the same size. How much material did she use for each tablecloth?*	
	Plan: 14 m 36 cm ÷ 4 *C:* 1436 cm ÷ 4 = 359 cm = <u>3 m 59 cm</u>	
	Answer: Mum used 3 m 59 cm for each tablecloth.	
	25 min	
5	***Book 4, page 20, Q.2***	Whole class activity
	Read: *Mary had a length of ribbon which measured 9 m 24 cm. She cut 4 pieces from it, each 124 cm long. What length of ribbon was left?*	(or individual work if Ps prefer)
	What has the diagram to do with the question? How can we solve it? Ps come to BB to explain diagram and suggest methods of solution. Class agrees/disagrees or offers alternative methods.	Diagram drawn on BB.
		Reasoning, agreement, praising
	e.g Length of ribbon: 9 m 24 cm = 924 cm	
	Length cut off: 4 × 124 cm	
	Length left: 924 cm – 4× 124 cm = 924 cm – 496 cm = 428 cm = <u>4 m 28 cm</u>	
	T writes new information on diagram as it is calculated.	
	Answer: 4 m 28 cm of ribbon remainded.	
	30 min	

	4	5	1	0	×	3
1	3	5	3	0		

1

	1	8	7	×	6
1	1	2	2		

5 4

		2	4	r 2
7	1	7	0	

3 ②

24 full bottles + 2 cl left over

		3	5	9
4	1	4	3	6

2 3

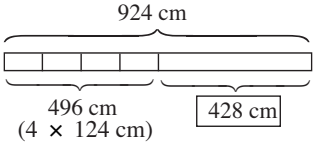
C:

1	2	4	×	4
4	9	6		

1

–

9	$^{10}2$	$^{10}4$
4_1	9_1	6
4	2	8



Bk4

Lesson Plan 20

Activity		*Notes*
6	***Book 4, page 20*** Q.3 Read: *A train travels at a speed of 20 m per second on average. Complete the table.* Discuss what 'on average' means. (The train might slow down in places and speed up in others but if we take the total distance for each journey and divide it by the total time taken, then we get an <u>average</u> speed, as if the train was travelling at the same speed every second.) Deal with one table at a time. (Results from table a) will help with table b)). Necessary calculations done in *Ex. Bks*. Review at BB with whole class. Ps come to BB or dictate to T, explaining reasoning. Mistakes discussed and corrected. Extra praise if Ps notice connections in and between tables to make calculations easier. *Solution:* a) Journey time / Distance: 30 seconds – **600 m**; 1 minute – **1200 m**; 1 and a half minutes – **1800 m**; 50 seconds – **1000 m**; 45 seconds – **900 m** b) Distance / Journey time: 120 metres – **6 seconds**; 200 metres – **10 seconds**; 600 metres – **30 seconds**; 1200 metres – **60 seconds**; 2000 metres – **100 seconds** *38 min*	Individual work, monitored, helped Drawn on BB or use enlarged copy master or OHP Initial whole class discussion Ps explain what they think and T repeats in a clearer way if necessary. Reasoning, agreement, self-correction, praising. Connections: e.g. 1 minute = 2 × 30 seconds, 1 and a half minutes = 1 minute + 30 seconds, 45 seconds = 30 seconds + half of 30 seconds, etc. T points to a time or distance and Ps express it in another way, e.g. 100 sec. = 1 min. 40 sec. 1800 m = 1 km 800 m, 45 sec. = 3 quarters of a min.
7

Bk4

R: Sequences. Mental calculation
C: Revision and practice: numbers, calculations, measures
E: Problems

Lesson Plan
21

Activity		*Notes*
1	**Number analysis** Let's fill in this table. What do you think it means? If no P understands it, T does first column as a model for Ps to follow. Ps come to BB to complete the remaining columns. Class points out errors. BB:	Whole class activity Drawn on BB or use enlarged copy master or OHP At a good pace Reasoning, agreement, praising Let's read the numbers together.

Number	1834				1496				1509			
Digit value	1	8	3	4	1	4	9	6	1	5	0	9
Place value	1Th	8H	3T	4U	1Th	4H	9T	6U	1Th	5H	0T	9U
Real value	1000	800	30	4	1000	400	90	6	1000	500	0	9

Repeat with other 4-digit numbers suggested by Ps.

Feedback for T

4 min

2	***Book 4, page 21*** Q.1 Read: *Complete the table. Follow the example.* Let's see if you can complete this table by yourselves! Review at BB with whole class. Ps come to BB or dictate to T. Class agrees/disagrees. Mistakes discussed and corrected. *Solution:*	Individual work, monitored, helped Drawn on BB or use enlarged copy master or OHP Reasoning, agreement, self-correcting, praising

Number	1978				1083				1803			
Digit value	**1**	9	7	8	1	0	8	3	1	8	0	3
Place value	**1Th**	9H	7T	8U	1Th	0H	8T	3U	1Th	8H	0T	3U
Real value	**1000**	900	70	8	1000	0	80	3	1000	800	0	3

8 min

3	**Mental calculation** Write these numbers one below the other in your *Ex. Bks*. Make sure that the place values line up! T dictates numbers, e.g. 1231 68 904 360 Do these calculations in your head and show me the result on scrap paper or slates when I say. e.g. • Add the 1st, 2nd and 4th numbers. Show me . . . now! (1659) • Subtract the 4th number from the 1st number. Show me . . . now! (871) • Divide the 2nd number by 4 and add the result to the 3rd number. Show me . . . now! (921) etc.	Whole class activity Ps write numbers in *Ex. Bks*. to keep them in mind. Responses shown in unison. Ps answering correctly explain how they did the calculation. In good humour! Praising, encouragement only Ps can think of calculations too!

13 min

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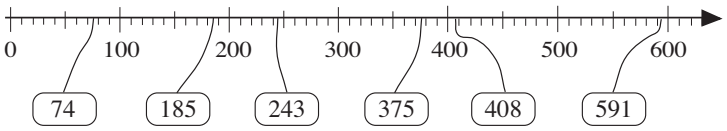
Bk4

Lesson Plan 21

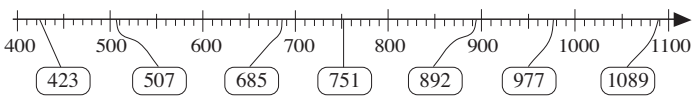
Activity		*Notes*
4	**Number line** a) Let's join up each number to its approximate position on the number line. Ps come to BB to say the number, point to its place on the number line and and draw joining line. Class agrees/disagrees. b) Let's write the next smaller and greater units, tens and hundreds for each number. Ps come to BB or dictate to T. Class points out errors. c) T points to each original number in turn. What is this number rounded to the nearest 10 (100)? Ps come to BB or dictate to T. Class points out errors. (Numbers could be coloured or starred.) BB:	Whole class activity Drawn on BB or use enlarged copy master or OHP At a good pace Reasoning, agreement, praising Agree that 5 rounds up What do you notice? (e.g. 591 rounds down to nearest ten but rounds up to nearest 100; 408 rounds to 400 as the nearest 10 and the nearest 100) Feedback for T



Next smaller100		Next smaller 10		Next smaller unit			Next greater unit		Next greater 10		Next greater 100
0	<	70	<	73	<	**74**	<	75	<	80	<	100
100	<	180	<	184	<	**185**	<	186	<	190	<	200
200	<	240	<	242	<	**243**	<	244	<	250	<	300
300	<	370	<	374	<	**375**	<	376	<	380	<	400
400	=	400	<	407	<	**408**	<	409	<	410	<	500
500	<	590	=	590	<	**591**	<	592	<	600	=	600

20 min

5	***Book 4, page 21*** Q.2 Read: *a) Join up the numbers to their approximate position on the number line.* *b) Write the next smaller and greater whole tens and hundreds in the boxes.* Set a time limit. Review at BB with whole class. Ps come to BB or dictate to T. Class agrees/disagrees. Mistakes discussed and corrected. For each middle number, colour the nearest ten *red* and the nearest hundred *yellow*. Review with whole class. *Solution:* a)	Individual work, monitored, helped Drawn on BB or use enlarged copy master or OHP Agreement, self-correction, praising Or done orally with whole class Ps tell what they notice. Who had them all correct? The person nearest them give them a pat on the back!



b)

400	<	420	<	**423**	<	430	<	500				
500	=	500	<	**507**	<	510	<	600				
600	<	680	<	**685**	<	690	<	700				
700	<	750	<	**751**	<	760	<	800				
800	<	890	<	**892**	<	900	=	900				
900	<	970	<	**977**	<	980	<	1000				
1000	<	1080	<	**1089**	<	1090	<	1100				

26 min

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Bk4

Lesson Plan 21

Activity		*Notes*
6	**Sequences** T says first few terms and also writes them on BB. Ps may do calculations on slates or scrap paper if they cannot do them mentally. Ps dictate the following terms and T writes on BB. Class points out errors. What is the rule? e.g. a) 18, 36, 72, (144, 288, 576, 1152, . . .) *Rule:* × 2 b) 10, 5, 20, 10, 30, 15, (40, 20, 50, 25, 60, 30, 70, 35, 80, 40, 90, 45, 100, 50, . . .) Elicit that this is a combination of 2 sequences: $a_1, a_3, a_5, \ldots$ 10, 20, 30, 40, . . . (*Rule*: + 10), and $a_2, a_4, a_6, \ldots$ 5, 10, 15, 20, 25, . . . (*Rule*: + 5) c) 70, 140, 210, (280, 350, 420, 490, 560, 630, 700, 770, 840, . . .) *Rule:* + 70, or the multiples of 70 starting at 70 How could we work out what the 20th term would be? Ask several Ps what they think. (BB: $a_{20} = 70 + 19 \times 70 = 20 \times 70 = \underline{1400}$) d) 1900, 1650, 1400, (1150, 900, 650, 400, 150, – 100, – 350, – 600, . . .) *Rule:* – 250 How could we have worked out the 8th term without writing all the terms before it? T asks several Ps what they think. Let's check it! (BB: $a_8 = 1900 - 7 \times 250 = 1900 - 1750 = \underline{150}$)	Whole class activity In order round class for terms up to 2000 (volunteers for terms over 2000 or under 0) Agreement, praising Discussion on the rule. T might need to give a hint for b). Let's call the first term a_1, the 2nd term a_2, the 3rd term a_3, etc. Discussion on general method for finding any term. Extra praise if Ps make any positive contribution – but have no expectations! BB: $\begin{array}{r} 250 \\ \times\ 7 \\ \hline 1750 \\ {\scriptstyle 3} \end{array}$ *Check:* $1900 - 1750 = 150$ ✔
	32 min	
7	***Book 4, page 21*** Q.3 Read: *Continue the sequence*. Deal with one part at a time. Set a time limit. Ps do necessary calculations in *Ex. Bks*. Review at BB with whole class. Ps dictate terms to T. Mistakes discussed and corrected. Discussion on the rule. *Solution:* a) 1024, 512, 256, (128, 64, 32, 16, 8, 4, 2, 1), [1 half, 1 quarter, 1 eighth, 1 sixteenth, . . .] Rule: ÷ 2 b) 10, 5, 20, 10, 40, 20, (80, 40, 160, 80, 320, 160, . . .) *Rule*: ÷ 2, then × 4, or combination of 2 sequences: $a_1, a_3, a_5, \ldots$ 10, 20, 40, . . . (*Rule*: × 2), and $a_2, a_4, a_6, \ldots$ 5, 10, 20, . . . (*Rule*: × 2) c) 520, 640, 760, (880, 1000, 1120, 1240, 1360, 1480, . . .) *Rule*: + 120 d) 900, 789, 678, (567, 456, 341, 230, . . .) *Rule*: – 111 e) 1, 4, 16, 64, (256, 1024), [4096, . . .] *Rule*: × 4	Individual work, monitored, helped (Or whole class activity for those T thinks are difficult) Keep to strict time limit, especially for d), where only 2 terms are expected. Reasoning, agreement, self-correction, praising Details of calculations written on BB if problems, e.g. d) $\begin{array}{r} 256 \\ \times\ 4 \\ \hline 1024 \\ {\scriptstyle 2\ 2} \end{array}$ $\begin{array}{r} 1024 \\ \times\ 4 \\ \hline 4096 \\ {\scriptstyle 1} \end{array}$ T starts to write multiplications in the conventional way. Extra praise for 7th term!
Extension	What is the 11th term of the sequence in part c)? (BB: $a_{11} = 520 + 10 \times 120 = 520 + 1200 = \underline{1720}$	Whole class activity or individual or paired work
	40 min	

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Bk4		*Lesson Plan 21*
Activity		***Notes***
8	***Book 4, page 21*** Q.4 Read: *Compare the quantities. Write in the missing signs.* Elicit that it might be easier to compare if both sides were the same unit. Set a time limit. Review at BB with whole class. Ps come to BB or dictate to T, explaining reasoning. Class agreese/disagrees. Mistakes discussed and corrected. How much more is the greater quantity? Ps dictate to T or come to BB. *Solution:* a) 18 m 32 cm (1832 cm) < 19 m (1900 cm) — 68 cm b) 1 litre 320 ml (1320 ml) < 1720 ml — 400 ml c) 4 kg 460 g (4460 g) > 894 g — 3566 g or 3 kg 566 g d) 1 m 8 cm 1 mm (1081 mm) < 176 cm (1760 mm) — 679 mm e) 48 days > 5 weeks 3 days (38 days) — 10 days f) 420 minutes < 7 hrs 31 min (451 min) — 31 min *45 min*	Individual work, monitored, helped Written on BB or SB or OHT Reasoning, agreement, self-correcting, praising Whole class activity Reasoning, agreement, praising Details of calculations shown on BB if necessary, e.g. c) $\begin{array}{r} {\scriptstyle 10}\ {\scriptstyle 10}\ {\scriptstyle 10} \\ 4\ 4\ 6\ 0 \\ -\ {\scriptstyle 1}\ 8_{1}\ 9_{1}\ 4 \\ \hline 3\ 5\ 6\ 6 \end{array}$ Feedback for T

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Bk4

R: Mental calculation
C: Sequences. Revision and practice of calculations (up to 2000)
E: Problems

Lesson Plan 22

Activity		*Notes*
1	**Mental calculation** If you were doing these calculations in your head, how would you do them? Ps come to BB or explain to T who writes on BB. Who agrees? Who would do it another way? Which is easier? If you could write it down, how would you do the calculation? Ps come to BB or dictate to T. Do you think it is quicker to write it down or do it mentally? BB: e.g. a) 48 + 37 = (85) 348 + 37 = (385) 348 + 437 = (785) (48 + 30 + 7) (348 + 30 + 7) (348 + 400 + 30 + 7) b) 64 – 26 = (38) 764 – 26 = (738) 764 – 226 = (538) (64 – 20 – 6) (764 – 20 – 6) (764 – 200 – 20 – 6) c) 49 × 3 = (147) 249 × 3 = (747) (40 × 3 + 9 × 3) (200 × 3 + 40 × 3 + 9 × 3) = 120 + 27 = 600 + 120 + 27 or (50 × 3 – 1 × 3) (250 × 3 – 1× 3) = 150 – 3 = 750 – 3 d) 87 ÷ 4 = (21, r 3) 432 ÷ 6 = (72) (80 ÷ 4 + 7 ÷ 4) (420 ÷ 6 + 12 ÷ 6) = 20 + 1, r 3 = 70 + 2 *8 min*	Whole class activity Operations written on BB or SB or OHT Discussion, reasoning, agreement, checking, praising BB: Agree that in general written calculations are simpler.
2	**Sequences** In each sequence, the difference between any two adjacent numbers is the same. Let's fill in the missing numbers. Ps come to BB to write the numbers above the lines, explaining reasoning. Class checks that they are correct. BB: a) 300, 294, 288, **282, 276, 270**, 264, 258, 252 *Rule*: – 6 b) 590, 610, 630, **650, 670, 690**, 710, 730, 750, 770 *Rule*: + 20 c) 805, 822, 839, **856, 873, 890**, 907, 924, 941, 958 *Rule*: + 17 *14 min*	Whole class activity T has bold numbers written in middle of BB or SB or OHT and horizontal lines drawn for the other terms. At a good pace Reasoning, agreement, praising
3	***Book 4, page 22*** Q.1 Read: *Practise addition*. You may do the calculations mentally or write them in your *Ex. Bks*. Let's see how many you can do in 3 minutes! Start . . . now! . . . Stop! Review with whole class. Ps change pencils and mark/correct their own work. Ps dictate answers, explaining reasoning. Class points out errors. Who had all 9 correct? Who made a mistake? What was your mistake? etc. Deal with all cases. *Solution:* a) 56 + 18 = 74 556 + 18 = 574 556 + 418 = 974 b) 43 + 29 = 72 243 + 29 = 272 243 + 929 = 1172 c) 37 + 48 = 85 937 + 48 = 985 937 + 548 = 1485 *20 min*	Individual work, monitored (less able Ps helped and they might only be expected to do the first two columns) Differentiation by time limit Reasoning, agreement, self-correction, praising Feedback for T

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Bk4		*Lesson Plan 22*
Activity		***Notes***
4	***Book 4, page 22*** Q.2 Read: *Practise subtraction*. You may do the calculations mentally or write them in your *Ex. Bks*. Let's see how many your can do in 3 minutes! Start . . . now! . . . Stop! Review with whole class. Ps change pencils and mark/correct their own or neighbour's work. Ps dictate answers, explaining reasoning. Class points out errors. Who had all 9 correct? Who made a mistake? What was your mistake? etc. Deal with all cases. *Solution:* a) 92 – 16 = 76 392 – 16 = 376 492 – 216 = 276 b) 63 – 27 = 36 863 – 27 = 836 863 – 127 = 736 c) 56 – 49 = 7 556 – 49 = 507 556 – 449 = 107 *26 min*	Individual work, monitored (less able Ps helped and they might only be expected to do the first two columns) Differentiation by time limit Reasoning, agreement, self-correction, praising Feedback for T Class applauds Ps who had 18 correct in Q.1 and Q.2.
5	***Book 4, page 22*** Q.3 Read: *In each sequence the difference between any term and the next term is the same. Write the missing terms.* Deal with one part at a time. Ps can do calculations in *Ex Bks*. Review at BB with whole class. Ps dictate terms to T and give the rule. Class agrees/disagrees. Mistakes discussed/corrected. *Solution:* a) 1000, 940, 880, **820, 760, 700**, 640, 580, 520 *Rule:* – 60 b) 100, 300, 500, **700, 900, 1100**, 1300, 1500, 1700 *Rule:* + 200 c) 50, 220, 390, **560, 730, 900**, 1070, 1240, 1410 *Rule*: + 170 d) 374, 360, 346, **332, 318, 304**, 290, 276, 262 *Rule*: – 14 e) 263, 275, **287**, 299**, 311,** 323, 335, 347, 359 *Rule*: + 12 *35 min*	Individual work, monitored, helped (or whole class activity) Written on BB or use enlarged copy master or OHP Discussion, reasoning, agreement, self-correction, praising Extra praise if Ps had e) correct! Discuss how to solve part e): BB: (311 – 287) ÷ 2 = 24 ÷ 2 = 12

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Bk4

Lesson Plan 22

Activity		*Notes*
6	***Book 4, page 22*** Q.4 Read: *Solve the problems in your exercise book.* Deal with one part at a time. Ps read the question themselves, make a plan, do the calculation and write the answer as a sentence in *Ex. Bks*. Review with whole class. Ps come to BB to show their solution, explaining reasoning. Who agrees? Who thinks something else? Who did it a different way? Who made a mistake? What kind of mistake? etc. *Solutions:* a) *60 swallows are resting on the wire between two telegraph poles. What weight is on the wire if each swallow weighs about 30 grams?* BB: 1 swallow: 30 g 60 swallows: 30 g × 60 30 g × 60 = 300 g × 6 = <u>1800</u> g = <u>1 kg 800 g</u> *Answer:* There is about 1 kg 800 g on the wire. b) *Every time we breathe in, we take about half a litre of air into our lungs. We take a breath about 20 times every miute. How much air do we breathe in during 30 minutes?* BB: 1 breath: half a litre 1 minute: 20 × half a litre 30 minutes: 30 × 20 × half a litre = 30 × 10 litres = <u>300 litres</u> *Answer:* We breathe in about 300 litres of air in 30 minutes. c) *A hare weighs about 8 kg and a brown bear can weigh 40 times as much. What could be the weight of a brown bear?* BB*:* hare: 8 kg brown bear: 40 × 8 kg = <u>320 kg</u> *Answer:* A brown could weigh about 320 kg *41 min*	Individual work, monitored, helped Ps could show answers on scrap paper or slates in unison on command. Reasoning, agreement, self-correcting, praising Make sure that Ps realise the importance of writing 'about' or 'roughly' or '≈' in answers. Feedback for T
7

Bk4

R: Mental calculation
C: Revision and practice of calculations (up to 2000)
E: Problems

Lesson Plan *23*

Activity		*Notes*
1	**Products** Let's choose from these digits [1] [2] [3] [5] and multiply a 3-digit number by a 1-digit number, so that the product is: a) the greatest possible, BB: 321 × 5 = 1605 b) the smallest possible, 235 × 1 = 235 c) an even number, e.g. 132 × 5 = 660; 315 × 2 = 630; 351 × 2 = 702 d) an odd number. e.g. 213 × 5 = 1065; 251 × 3 = 753 *6 min*	Whole class activity Numbers written on BB or number cards stuck to BB Ps come to BB to rearrange numbers and do calculations, explaining reasoning Class checks that they are correct or suggests alternative multiplications. At a good pace Agreement, praising
2	**Problem** Listen to the problem and picture it in your head. Write the data and do the calculation in your *Ex. Bks*. Show me the answer when I say. *The human skull is made up of 29 bones, the spinal column has 26 bones, each arm has 32 bones, each leg has 31 bones and the remaining part of the body has 25 bones.* *How many bones make up a human skeleton?* Show me . . . now! (206) P who responded correctly explains to those who did not. Mistakes discussed and corrected. BB: 29 + 26 + 32 + 32 + 31 + 31 + 25 = 180 + 26 = 206 (bones) or 29 26 64 62 + 25 206 *Answer:* The human skeleton is made from 206 bones. Would any of you like to be a doctor or nurse when you grow up? Why? Why not? *11 min*	Whole class activity T repeats question slowly and Ps repeat in own words. Responses written on scrap paper or slates and shown in unison. Reasoning, agreement, self-correction, praising Ps say answer as a sentence in unison. Short discussion involving as many Ps as possible.
3	**Find the mistakes** Pete is a year 4 pupil in another school. He is unsure of his units, so he has written several answers. Let's help him choose the correct one. Ps come to BB to cross out unrealistic data and say why they cannot be correct. Class agrees/disagrees. BB: a) Pete's height is: ~~13 m~~ ~~13 mm~~ ~~13 cm~~ 130 cm b) Pete's handspan is: 160 mm ~~160 cm~~ ~~1600 cm~~ c) Length of Pete's step is: ~~46 m~~ 46 cm ~~46 mm~~ d) Pete's age is: ~~103 years~~ ~~103 days~~ ~~103 weeks~~ 103 months	Whole class activity Written on BB or use enlarged copy master or OHP At a good pace Reasoning, agreement, praising In good humour!
Extension	What other data could be written down? Ps suggest criteria and Ps estimate their own data. (e.g. weight, how far away from school they live, length of little finger, how high (long) they can jump, etc.) *15 min*	Extra praise for creative suggestions.

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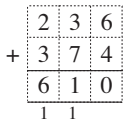
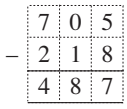
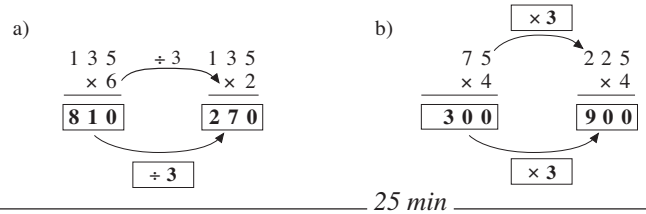
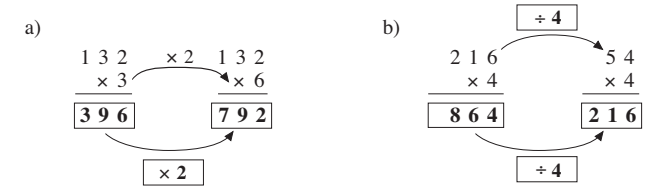
Bk4

Lesson Plan 23

Activity		*Notes*
4	***Book 4, page 23*** Q.1 Read: *Solve the problems in your exercise book.* Deal with one part at a time. Ps read the question themselves, make a plan, do the calculation and write the answer as a sentence in *Ex. Bks*. Review with whole class. Ps come to BB to show their solution, explaining reasoning. Who agrees? Who thinks something else? Who did it a different way? Who made a mistake? What kind of mistake? etc. *Solutions:* a) *An athlete won a high jump competition with a jump of 236 cm. A dolphin can leap out of the water and into the air to a height which is 374 cm above that reached by the high jumper.* *How high can this dolphin jump?* BB: A: 236 cm D: 236 cm + 374 cm = 610 cm *Answer:* This dolphin can jump to a height of 610 cm. b) *A milk churn contained 7 litres 5 cl of milk. The farmer's wife used 2 litres 18 cl of the milk to feed some newborn lambs. How much milk was left in the churn?* BB: Had: 7 litres 5 cl = 705 cl Used: 2 litres 18 cl = 218 cl Had left: 705 cl – 218 cl = 487 cl = 4 litres 87 cl *Answer:* There was 4 litres 87 cl of milk left in the churn. *21 min*	Individual work, monitored, helped (Ps could show answers on scrap paper or slates in unison on command.) Reasoning, agreement, self-correcting, praising Feedback for T  
5	**Factors and products** Study the diagrams. Note how do the factors and products change. Let's fill in the missing numbers and signs. Ps come to BB to fill in missing items, explaining reasoning. Class agrees/disagrees. What do you notice? (If a factor is increased by a certain number of times, the product also increases by that number of times.) BB:  *25 min*	Whole class activity Drawn on BB or use enlarged copy master or OHP Reasoning, agreement, praising Feedback for T
6	***Book 4, page 23*** Q.2 Read: *Look at how the factors and products change. Fill in the missing numbers and signs.* Review at BB with whole class. Ps come to BB or dictate to T. Class agrees/disagrees. Mistakes discussed and corrected. *Solution:*  *30 min*	Individual work, monitored, helped Drawn on BB or use enlarged copy master or OHP Discussion, reasoning, agreement, self-correction, praising

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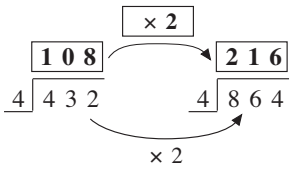
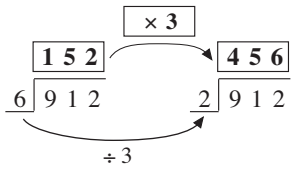
Bk4

Lesson Plan 23

Activity		*Notes*
7	***Book 4, page 23, Q.3*** Read: *Look at how the dividends, divisors and quotients change. Fill in the missing numbers and signs.* Ps work out the divisions first in *Ex. Bks*. Ps come to BB to fill in missing quotients. Class agrees/disagrees. Then Ps fill in missing operations. Class checks mentally. What do you notice? (e.g. If the dividend increases by a certain number of times, the quotient also increases by that number of times; if the divisor decreases by a certain number of times, the quotient increases by that number of times) *Solution:* a)  b)  	Whole class activity (or individual work if Ps wish) Drawn on BB or use enlarged copy master or OHP Reasoning, agreement, praising T repeats what Ps have noticed more clearly if necessary.
	35 min	
8	***Book 4, page 23*** Q.4 Read: *Solve the problems in your exercise book.* Give Ps a set time to read questions themselves and do the calculations in *Ex. Bks*. Check that the amounts add up to 1200! Review with whole class. T (or a P) reads each question and Ps show results on scrap paper or slates on command. Ps who responded correctly explain to those who did not. Mistakes discussed and corrected. *Solutions:* *Flora has collected 1200 1 p coins and she wants to put them in two piggy banks. How many coins should she put in each piggy bank so that there is:* a) *twice as much money in one piggy bank as in the other?* BB: 1200 ÷ 3 = 400; (PB_1: 400 and PB_2: 800) b) *half as much money in one piggy bank as in the other?* BB: 1200 ÷ 3 = 400; (PB_1: 400 and PB_2: 800) c) *three times as much money in one piggy bank as in the other?* BB: 1200 ÷ 4 = 300; (PB_1: 300 and PB_2: 900) d) *1 third as much money in one piggy bank as in the other?* BB: 1200 ÷ 4 = 300; (PB_1: 300 and PB_2: 900) e) *five times as much money in one piggy bank as in the other?* BB: 1200 ÷ 6 = 200; (PB_1: 200 and PB_2: 1000) f) *1 fifth as much money in one piggy bank as in the other?* BB: 1200 ÷6 = 200; (PB_1: 200 and PB_2: 1000) g) *1 seventh as much money in one piggy bank as in the other?* BB: 1200 ÷ 8 = 150 (PB_1: 150 and PB_2: 1050)	Individual work, monitored, to start, then whole class review (or all done as a whole class activity, one at a time) Piggy Banks drawn on BB or use enlarged copy master Discussion, reasoning, agreement, self-correction, praising Extra praise if Ps realise that a) and b), c) and d), etc. are really the same question, e.g. • twice as much in PB2 is the same as half as much in PB1 • 3 times as much in PB2 is the same as 1 third as much in PB1. T could show solution like this: Let s = smaller amount a) PB_1: s, PB_2: $2 \times s$ $s + 2 \times s = 3 \times s = 1200$ $s = 1200 \div 3 = 400$ So PB_1: 400 and PB_2: $2 \times 400 = 800$ c) PB_1: s, PB_2: $3 \times s$ $s + 3 \times s = 4 \times s = 1200$ $s = 1200 \div 4 = 300$ So PB_1: 300 and PB_2: $3 \times 300 = 900$ etc.
	45 min	

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