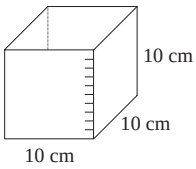
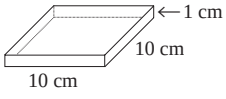
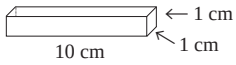
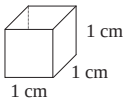
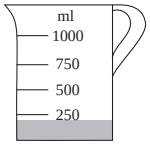
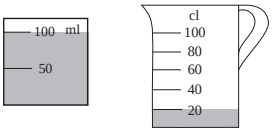
# Y3

R: Calculation up to 1000
**C: Measurement of capacity:** ℓ, cl, ml
*E: Numbers up to 2000*

## *Lesson Plan* *81*

| *Activity* | | *Notes* |
|---|---|---|
| **1** | **Revision of capacity**<br>What is capacity? (How much liquid a container can hold)<br>Who can tell me the standard units we use to measure capacity? (litre, cl, ml) Which is the biggest (smallest)? (litre, ml)<br>Elicit that: 1 litre = 100 centilitres = 1000 millilitres (BB)<br>Remind Ps that 'centi' means 1 hundredth and 'milli' means 1 thousandth.<br>T has 4 containers on desk to show how much water is in 1 litre, 1 tenth, 1 hundredth (1 cl) and 1 thousandth (1 ml) of a litre.<br>1. <u>10 cm by 10 cm by 10 cm container</u> (cube)<br>Elicit that the volume of the space inside this container is 1000 cm cubes (1000cc).<br>Demonstrate if necessary by filling with10 layers of 10 rows of 10 1 cm cubes stuck together or use '10' rods from Cuisennaire.)<br>**1 litre**<br>  <br><br>How much water do you think it can hold? (1 litre)<br>T demonstrates by filling cube with water, then pouring into a measuring jug.<br>2. <u>10 cm by 10 cm by 1 cm container</u> (1 layer)<br>Elicit that volume of the space inside this container is 100 cm cubes (100 cc).<br>**10 cl**<br>  <br><br>How much water do you think it can hold? (1 <u>tenth</u> of a litre or 10 cl or 100 ml) Demonstrate with cubes and water if necessary.<br>3. <u>10 cm by 1cm by 1 cm container</u> (1 row or rod)<br>Elicit that volume of the space inside this container is 10 cm cubes (10 cc).<br>**1 cl**<br>  <br><br>How much water do you think it can hold? (1 <u>hundredth</u> of a litre or 1 cl or 10 ml) Demonstrate with cubes and water if necessary.<br>4. <u>1 cm by 1 cm by 1 cm</u> container (1 cm cube)<br>What is the volume of the space inside this container?<br>**1 ml**<br>  <br><br>(1 cc) How much water can do you think it can hold? (1 <u>thousandth</u> of a litre or 1 ml)<br>T says , e.g., 1 litre (10 cl, 1 cl, 1 ml) Ps select appropriate container.<br>*10 min* | Whole class activity<br>T has items of different capacity on a table (e.g. litre bottles, cartons, measuring jugs, plastic medicine cups and spoons)<br>Already prepared from laminated card or foil and/or draw diagrams on BB or use enlarged copy master (for reference only)<br>(If possible, Ps have cubes and containers on desks too.)<br>1. $V = 10\text{ cm} \times 10\text{ cm} \times 10\text{ cm}$<br>$= 1000$ cm cubes (cc)<br>*Capacity* = <u>1 litre</u><br>T shows litre bottle/carton<br>2. $V = 10\text{ cm} \times 10\text{ cm} \times 1\text{ cm}$<br>$= 100$ cc $= 1$ tenth of 1000 cc<br>*Capacity* = <u>1 tenth</u> of a litre<br>= 1 tenth of 100 cl = 10 cl<br>T shows 10 cl medicine cup<br>3. $V = 10\text{ cm} \times 1\text{ cm} \times 1\text{ cm}$<br>$= 10$ cc<br>= 1 hundredth of 1000 cc<br>*Capacity* = 1 <u>hundredth</u> of a litre<br>= 1 cl = 10 ml<br>T shows a 1 cl spoon<br>4. $V = 1\text{ cm} \times 1\text{ cm} \times 1\text{ cm}$<br>$= 1$ cc<br>= 1 <u>thousandth</u> of 1000 cc<br>T shows a 1 ml spoon.<br>Agreement, praising |
| **2** | **Measuring capacity**<br>A recipe needs us to pour 20 cl of water into a pan. How could we measure this quantity? Ask several Ps for suggestions. e.g.<br>• Use the 10 cl (100 ml) measuring cup. Fill it to the 10 cl mark, then pour the water into the pan. Do the same again.<br>• Use the cl measuring jug and fill it to the 20 cl mark.<br>How could we use this measuring jug?<br>Elicit that scale is in ml and that 20 cl = 200 ml<br>  <br><br>• We can estimate the amount by filling the jug to just below the 250 ml mark.<br>Repeat for other quantities, using available containers.<br>• Find <u>approximate</u> capacities of a cup, glass , bottle, etc. by filling with water, pouring into a measuring jug and reading the nearest mark on the scale.<br>*20 min* | Whole class activity<br>Ps come to T's desk to choose an appropriate measuring item, e.g.<br>  <br><br>Explanation, demonstration with T's help, agreement, praising only<br>Ps choose the container.<br>Ps estimate its capacity first.<br>Scale read with T's help |

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# Y3

*Lesson Plan 81*

| *Activity* | | *Notes* |
|---|---|---|
| **3** | **Sequences**<br>T says first 3 terms of a sequence. Ps continue it in *Ex. Bks.*<br>a) 5 cl. 20 cl, 35 cl, (50 cl, 65 cl, 80 cl, 95 cl, 110 cl, 125 cl, . . .)<br>b) 1200 ml, 1150 cl, 1100 ml, (1050 ml, 1000 ml, 950 ml, . . .)<br>c) 30 cl, 350 ml, 40 cl, (450 ml, 50 cl, 550 ml, 60 cl, 650 ml, . . .)<br>T asks for the rule after each one. a) + 15 cl, b) – 40 ml, c) + 50 ml, but units given first in cl, then in ml, then in cl, etc.<br>Underline all the quantities which are more than one 1 litre.<br>Review orally round class. Ps change the units for each into litres and cl or litres and ml. e.g. 110 cl = 1 ℓ 10 cl; 1200 ml = 1 ℓ 200 ml<br>Mistakes discussed and corrected. | Individual work, monitored (helped)<br>T sets time limit for each<br>Discussion at BB or SB or OHP<br>Agreement, self-correction, praising<br>a) 110 cl, 125 cl, . . .<br>b) 1200 ml, . . ., 1050 ml<br>c) 1050 ml, . . . |
| | *25 min* | |
| **4** | ***PbY3b, page 81***<br>Q.1 Read: *Change the quantities.*<br>Elicit that : 1 cl = 10 ml 1 ml = 1 tenth of a cl<br>10 cl = 100 ml 100 cl = 1000 ml = 1 ℓ<br>Review orally with whole class. Mistakes discussed and corrected.<br>Which are more than 1 litre? In what other way could you say them?<br>*Solution:*<br>a) 3 cl = 30 ml<br>7 cl = 70 ml<br>12 cl = 120 ml<br>20 cl = 200 ml<br>105 cl = 1050 ml<br>b) 40 ml = 4 cl<br>320 ml = 32 cl<br>400 ml = 40 cl<br>1000 ml = 100 cl<br>1540 ml = 154 cl | Individual work monitored, helped<br>Agreement, self-correction, praising<br>e.g. 105 cl = 1 ℓ 5 cl<br>(= 1 ℓ 50 ml)<br>1540 ml = 1 ℓ 540 ml<br>(= 1 ℓ 54 cl)<br>Feedback for T |
| | *29 min* | |
| **5**<br><br><br><br>**Extension** | ***PbY3b, page 81***<br>Q.2 Read: *Follow the example. Fill in the missing quantities.*<br>Do one part at a time. Who can explain the example in a)?<br>(e.g. 10 ml = 1 cl; 45 ml = 4 × 10 ml + 5 ml = 4 cl + 5 ml)<br>Review at BB with whole class. Mistakes discussed and corrected.<br>Ask Ps to find quantities which can be expressed in other ways. e.g. 1999 ml = 199 cl 9 ml = 1 ℓ 99 cl 9 ml, or 1999 ml < 2 ℓ (1 ml)<br>*Solution:*<br>a) 45 ml = 4 cl 5 ml<br>145 ml = 14 cl 5 ml<br>76 ml = 7 cl 6 ml<br>376 ml = 37 cl 6 ml<br>999 ml = 99 cl 9 ml<br>b) 1009 ml = 100 cl 9 ml<br>1209 ml = 120 cl 9 ml<br>1054 ml = 105 cl 4 ml<br>1230 ml = 123 cl<br>1999 ml = 199 cl 9 ml | Individual work, monitored, helped<br>T has BB already prepared<br>Discussion, agreement, self-correction, praising<br>Whole class activity<br>Ps choose a quantity and suggest alternative ways to express it. Class agrees/ disagrees.<br>Praising, encouragement only |
| | *33 min* | |
| **6** | ***PbY3b, page 81, Q.3***<br>Read: *An adult needs about 2 litres of water per day. Half of this amount is contained in food and other liquids.*<br>T shows class a 2 litre bottle of water. Elicit that 1 litre (half of 2 ℓ) is contained in other food/drink. Discuss what food and drink might contain water (e.g. milk, orange juice, tea, coffee, custard, sauces, gravy, stews, casseroles, etc.) | Whole class discussion involving several Ps<br>Ask Ps to think of what they eat and drink in a day<br>T gives hints if Ps cannot think of any. |

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# Y3

*Lesson Plan 81*

| ***Activity*** | | ***Notes*** |
|---|---|---|
| | Listen to the questions. Work out the answer in your *Pbs* books, then show me the result when I say. Remember to write the units too! | Individual work in *Pbs* |
| | a) Read: *If a man drinks the same amount of water 4 times per day to make up the extra, how much water should he drink each time?* | Responses shown on scrap paper or plastic 'slates' |
| | Show me your answer . . . now! (25 cl or 250 ml or 1 quarter of a $\ell$) | T or P reads question. Another P repeats in own words. |
| | **A**, explain to us how you worked out the answer. Who agrees? Who did it a different way? etc. Mistakes discussed and corrected. | In unison |
| | BB: Half of 2 litres: 1 litre Litres remaining: 1 litre | Reasoning, agreement, self-correcting, praising |
| | Amount in each drink: $1\ \ell \div 4 = 100$ cl $\div 4 =$ <u>25 cl</u> | or $1\ \ell \div 4 =$ 1 quarter of a $\ell$ |
| | | or 1000 ml $\div 4 =$ 250 ml |
| | b) Read: *How much water should he drink each time if he drinks 5 times per day?* | T or P reads question. Another P repeats it. |
| | Show me your answer . . . now! (20 cl or 200 ml or 1 fifth of a $\ell$) | In unison |
| | **B**, explain to us how you worked out the answer. Who agrees? Who did it a different way? etc. Mistakes discussed and corrected. | Reasoning, agreement, self-correcting, praising |
| | BB: Amount in each drink: $1\ \ell \div 5 = 100$ cl $\div 5 =$ <u>20 cl</u> | or $1\ \ell \div 5 =$ 1 fifth of a $\ell$ |
| | *37 min* | or 1000 ml $\div 5 =$ 200 ml |
| **7** | ***PbY3b, page 81, Q.4*** | Whole class activity |
| | Read: *Sue and Jane share 2 litres of orange juice between them. Complete the table.* | Drawn on BB or use enlarged copy master or OHP |
| | Who can explain what the table means? (Top row is amount of juice that Sue drinks, bottom row is amount that Jane drinks.) | Discussion, reasoning, agreement, praising |
| | Ps come out to choose a column and fill in the missing quantitity, explaining reasoning. Class agrees/disagrees. | At a good pace |
| | Which column in the table shows how they shared the juice <u>equally</u>? (*S*: 1 litre, *J*: 1 litre) | |
| | Who can write the rule? Who agrees? Who can write it another way? | (Or done as individual work, reviewed with whole class) |
| | *Solution*: | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| *S* | **1 litre** | half a litre | 130 cl | **70 ml** | 1170 ml | **115 cl** | 600 ml | 0 cl |
| *J* | 1 litre | **1 and a half litres** | **70 cl** | 1930 ml | **830 ml** | 85 cl | **1400 ml** | **200 cl** |

*Rule*: $S = 2$ litres $- J$, $J = 2$ litres $- S$, $S + J = 2$ litres

| | | |
|---|---|---|
| **Extension** | Think of other ways to express the quantities in each column. (e.g. 50 cl + 150 cl, 7 cl + 193 cl, $1\ \ell$ 17 cl + 83 cl, 2 litres + 0, etc.) | Ps could also suggest other columns to add to table. |
| | *42 min* | |
| **8** | **Rounding quantities** | Whole class activity |
| | a) T says a quantity in cl. Ps round it to the nearest litre. | At speed round class |
| | (e.g. T: 180 cl, P: 2 litres; T: 225 cl, P: 2 litres, etc.) | Ps can suggest quantities to be rounded too. |
| | b) T says a quantity in ml. Ps round it to the nearest cl. | Praising, encouragement only |
| | (e.g. T: 1577 ml, P: 158 cl; T: 121 ml, P: 12 cl, etc.) | In good humour! |
| | If problems, write on BB as, e.g., <u>2 litres</u> $<$ 225 cl $<$ 3 litres (25 cl, 75 cl) so 225 cl is nearer 2 litres than 3 litres. | |
| | *45 min* | |

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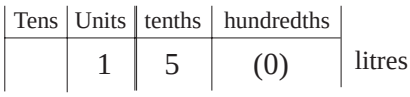
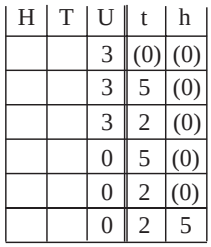
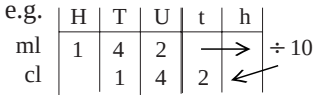
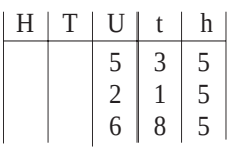
# Y3

R: Mental calculation

**C: Estimating, changing, rounding measures of capacity**

*E: Numbers up to 2000. Decimal notation.*

## *Lesson Plan* *82*

| *Activity* | | *Notes* |
|---|---|---|
| **1** | **Estimating capacity**<br>T has various containers on desk at front of class. (e.g. cups, glasses, jugs, vases, etc.), a bucket of water and measuring cups, jugs, etc. for 1 litre, 10 cl, 1 cl (1 pint, half a pint).<br>Ps come to front of class to choose a container, estimate its capacity, then choose an appropriate unit to measure it (with T's help).<br>*5 min* | Whole class activity<br>At a good pace<br>Show that 1 pint $<$ 1 litre<br>Class applauds close estimates. |
| **2** | **Decimal notation**<br>T has a 1 and a half litre bottle to show to class. **A**, come and write on the BB the capacity written on the bottle.<br>We read it as 'one point five litres'. Who knows what it means? (It means 1 litre and 5 tenths of a litre.) Let's show it in a place value table. Ps suggest where the digits should be written.<br>BB:  <br><br>Elicit or explain that: 1.5 $\ell$ = 1 $\ell$ and 5 tenths of a litre<br>= 15 tenths of a litre = 150 cl<br>It can also be shown as: 1.5 $\ell$ = 1 $\ell$ and 50 hundredths of a litre<br>= 150 hundredths of a litre = 150 cl<br>Let's change these quantities from litres to centilitres. T writes on BB as litres and Ps come out to write as cl. Class agrees/disagrees.<br>BB:. 3 $\ell$ = 300 cl, 3.5 $\ell$ = 350 cl, 3.2 $\ell$ = 320 cl<br>0.5 $\ell$ = 50 cl, (half a litre) 0.2 $\ell$ = 20 cl, 0.25 $\ell$ = 25 cl (1 quarter of a litre)<br>Point out that 0.25 is read as 'nought point two five', not 'twenty-five'<br>What is this quanitity? T writes on BB: 2.5 cl. Let's read it together. (two point five centilitres) What does it mean? (It means 2 cl and 5 tenths of a cl.) Elicit that 2.5 cl = 25 ml.<br>Let's change these quantities into cl. Ps suggest to T what to write.<br>BB: 37 ml = 3.7 cl, 142 ml = 14.2 cl, 3.2 $\ell$ = 320 cl<br>T elicits what is happening. (As 10 ml = 1 cl, then to change ml to cl you must divide by 10). Show on a place value table.<br>The dot separating whole units from parts of units is called the decimal point. The number is called a decimal number.<br>*10 min* | Whole class activity<br>BB: 1.5 $\ell$<br>Class repeats after T<br>Agreement, praising<br>Table drawn on BB or OHT<br>BB: 1 tenth of a litre = 10 cl<br>1 hundredth of a litre = 1 cl<br>Show on place value table.<br>BB: In litres<br>  <br><br>BB: 1 cl = 10 ml<br>Agreement, praising<br>e.g.<br>  <br><br>BB: 142 ÷ 10 = 14.2<br>14.2 is a decimal number. |
| **3** | **Comparing capacities**<br>Which is more? How many more? Ps come out to write in missing signs, explaining reasoning. Elicit that it is easier to change the litres into cl to calculate how much more one side is. Ps change each value to cl and write difference. Show decimals in a place value table.<br>BB: a) 5 $\ell$ 35 cl (535 cl) = 5.35 $\ell$ (535 cl)<br>b) 2.15 $\ell$ (215 cl) < 3 $\ell$ (300 cl) 85 cl<br>c) 7 $\ell$ (700 cl) > 6.85 $\ell$ (685 cl) 15 cl<br>litres<br>  <br><br>*15 min* | Whole class activity<br>T has BB (or SB or OHT) already prepared<br>BB:<br>1 cl = 1 hundredth of a litre<br>10 cl = 1 tenth of a litre<br>Let Ps suggest what to do. If problems show that, e.g.<br>7 $\ell$ > 6.85 $\ell$ > 6 $\ell$<br>Do not expect too much! |

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# Y3

*Lesson Plan 82*

| *Activity* | | *Notes* |
|---|---|---|
| **4** | **Missing quantities**<br>Let's find the quantities which make the statements true.<br>What should we do first? (Work out the value of the known side.)<br>Ps come out to BB to do the calculations, then to fill in the missing quantities, explaining reasoning. Class agrees/disagrees.<br>BB:<br>a) 800 cl – 3 × 50 cl (650 cl; 150 cl) = 400 cl + [250 cl] (or 2 ℓ 50 cl)<br>b) 2 ℓ 40 cl + 2 ℓ ÷ 4 (290 cl; 50 cl) = 3 ℓ – [10 cl] (300 cl – 290 cl = 10 cl)<br>c) 6 ℓ 25 cl + 1 ℓ 30 cl (755 cl) > 7 ℓ 50 cl (750 cl) + [ ] [ (0, 1, 2, 3, 4) cl ]<br>d) 1 ℓ 25 cl 4 ml (1254 ml) < 1 ℓ 24 cl (1240 ml) + [ ] (any quantity > 14 ml)<br>Allow Ps to decide and to suggest alternatives. Do not try to cover all possible ways – only if Ps suggest them.<br>*20 min* | Whole class activity<br>T has BB or SB or OHT already prepared<br>Discuss how to solve each one and what standard unit to use<br>Possible solutions are shown opposite but other units could be used, e.g. in<br>b) use ℓ and cl,<br>c) several solutions possible if ml is used,<br>d) cl and ml could be used.<br>In each statement, ℓ could be used (as decimals), e.g.<br>a) 8 ℓ – 1.5 ℓ = 4 ℓ + 2.5 ℓ |
| **5** | ***PbY3b, page 82***<br>Q.1 Read: *This baby's bottle has marks at every 10 ml up to 250 ml.*<br>*a) How many marks are on the bottle?*<br>How could we find out? (Count the marks or calculate how many 10 ml are in 250 ml.)<br>**B**, come and write the division. Rest of the class count the marks on the diagram as a check. Is **B** correct?<br>BB: 250 ml ÷ 10 ml = 25 (times), so there are 25 marks.<br>What does the first (2nd) mark show? (10 ml, 20 ml)<br>Let's see if you can do part b) on your own.<br>Read: *b) How much milk will be in the bottle if it is level with:*<br>*i) the 5th mark?* (5 × 10 ml = 50 ml)<br>*ii) the 7th mark?* (7 × 10 ml = 70 ml)<br>*iii) the 10th mark?* (10 × 10 ml = 100 ml)<br>*iv) the 20th mark?* (20 ×10 ml = 200 ml)<br>Review at BB with whole class. Mistakes corrected.<br>*25 min* | Whole class activity to start<br>Drawn on BB or use enlarged copy master or OHP<br>T could have a real baby's bottle to show (if possible, marked as shown in the *Pbs*.)<br>Agreement, praising<br>Ps shout out in unison.<br>Individual work, monitored, helped<br>Reasoning, agreement, self-correction, praising<br>If there was a mark at zero, how many marks would there be on the bottle? (26) |
| **6** | ***PbY3b, page 82***<br>Q.2 What can you tell me about the measuring jug in the picture?<br>(Unit used is ml. It has marks at every 250 ml. The most it can measure at a time is 1000 ml (or 1 litre).)<br>If we needed to measure 1 litre 250 ml, could we use this jug? (Yes – fill it once to the 1000 ml then again to the 250 ml mark.)<br>Read: *How many 5 cl glasses of water would it take to fill up this measuring jug to:*<br>*a) the 1st mark, b) the 2nd mark,*<br>*c) the 3rd mark d) the 4th mark?*<br>What will you have to do first? (Change the ml marks to cl, e.g 250 ml = 25 cl) Review at BB with whole class.<br>*30 min* | Whole class discussion to start.<br>Jug drawn on BB or use enlarged copy master or OHP<br>T could have a litre jug and 5 cl glass to show to class if possible<br>Reasoning, agreement, self-correction, praising<br>*Solution*:<br>a) 25 cl ÷ 5 cl = 5 (times)<br>b) 50 cl ÷ 5 cl = 10 (times)<br>c) 75 cl ÷ 5 cl = 15 (times)<br>d) 100 cl ÷ 5 cl = 20 (times) |

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# Y3

*Lesson Plan 82*

| *Activity* | | *Notes* |
|---|---|---|
| **7** | ***PbY3b, page 82***<br>Q.3 Read: *Complete the table.*<br>Study the table carefully. Who can explain it? (A quantity is shown in ml (top row), cl (2nd row), 10 cl (3rd row and litres (bottom row).<br>How do the numbers change? (divided by 10 each time)<br>Review at BB with whole class. Ps come out to fill in the missing numbers, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected.<br>*Solution:* | Individual work, monitored, helped<br>(Or as whole class activity)<br>Drawn on BB or use enlarged copy master or OHP<br>Discussion, reasoning, agreement, self-correction, praising<br>If no P has used decimals, T suggests that shortest way to write bottom row is to use decimal numbers.<br>Ps dictate what they should be. |
| **Extension** | Let's label the rows *A*, *B*, *C* and *D*. Who can write equations about the numbers in the rows? Who agrees? Who can write another one? etc.<br>(e.g. $A = 10 \times B = 100 \times C = 1000 \times D$;<br>$B = 10 \times C = 100 \times D =$ 1 tenth of $A$;<br>$C = 10 \times D =$ 1 tenth of $B =$ 1 hundredth of $A$;<br>$D =$ 1 tenth of $C =$ 1 hundredth of $B =$ 1 thousandth of $A$) | Whole class activity<br>Reasoning, agreement, praising<br>Extra praise if Ps suggest the fractions without help. |
| | *36 min* | |
| **8** | ***PbY3b, page 82***<br>Q.4 Read: *Elephant drank 4 more litres of water than Rhino. Complete the table.*<br>As there is not much room in the table, T should encourage Ps to think of short ways to write the missing values (or to write very small on two lines inside the space).<br>Review at BB with whole class. Ps come out to fill in the missing numbers, explaining reasoning. Class agrees/disagrees. Ask for values in litres (decimals) and also in cl. Mistakes discussed and corrected.<br>*Solution:* | Individual work, monitored, helped<br>Drawn on BB or use enlarged copy master or OHP<br>Discussion, reasoning, agreement, self-correction, praising<br>e.g. 35 litres = 3500 cl<br>32 ℓ 20 cl = 3220 cl<br>N.B. The last column in the table is to see what Ps do!)<br>Feedback for T |
| **Extension** | Think of other values which could be added to the table. | Orally or in *Ex. Bks.* |
| | *41 min* | |
| **9** | ***PbY3b, page 82, Q.5***<br>Read: *Write the rule and complete the table.*<br>Let Ps discuss in pairs for a couple of minutes to find the rule.<br>Ask Ps what they think, then check with values in table.<br>If no P knows, then T gives the rule. Ps fill in missing values in table.<br>*Rule*: The number in *B* is the number in *A* rounded to the nearest 10. (any unit) | Individual or paired trial first<br>Drawn on BB or use enlarged copy master or OHP<br>Ps dicate numbers to T or come out to BB.<br>Agreement, praising |
| | *45 min* | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| *A* | ml | **1200** | **2000** | **800** | 1230 | 1500 | 1900 | **1850** |
| *B* | cl | **120** | 200 | 80 | 123 | 150 | **190** | 185 |
| *C* | 10 cl | **12** | 20 | 8 | 12 and 3 tenths | **15** | 19 | 18 and a half |
| *D* | litres | **1 and 2 tenths** (1.2) | 2 | 8 tenths (0.8) | **1 and 23 hundredths** (1.23) | 1 and a half (1.5) | 1 and 9 tenths (1.9) | 1 and 85 hundredths (1.85) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **35 litres** | 51 litres | (33.5 ℓ) 33 and a half litres | **1350 cl** | (32.2 ℓ) 32 litres 20 cl | (23.3 ℓ) 23 and 3 tenths litres | **41.3 litres** |
| | 31 litres | **47 litres** | **29 and a half litres** (29.5 ℓ) | 950 cl | **28 litres 20 cl** (28.2 ℓ) | **19 and 3 tenths litres** (19.3 ℓ) | 37.3 litres |

*Rule:* $E = R + 4$ litres, $R = E - 4$ litres, 4 litres $= E - R$

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# Y3

R: Mental calculation
**C: Money problems. Changing units. Decimal notation for £.**
*E: Calculation up to 2000*

## *Lesson Plan* *83*

| *Activity* | | *Notes* |
|---|---|---|
| **1** | **Units of measure**<br>What different measures are there? (e.g. length, mass, capacity, money, time, (temperature).<br>a) What are the standard units of length? Let's write them in increasing order.<br>BB: 1 mm < 1 cm < 1 m < 1 km<br>×10 ×100 ×1000<br>What must we multiply 1 mm by to get 1 cm? (1 cm by to get 1 m? 1 m by to get 1 km?) (×10, ×100, ×1000)<br>Explain that: BB: 1 millimetre = 1 thousandth of a metre<br>1 centimetre = 1 hundredth of a metre<br>1 kilometre = 1000 metres<br>b) What are the standard units of capacity? Let's write them in increasing order. What must we multiply 1 ml by to get 1 cl? (1 cl by to get 1 litre?) T writes responses on BB.<br>Elicit that: BB: 1 millilitre = 1 thousandth of a litre<br>1 centilitre = 1 hundredth of a litre<br>c) What are the standard units of mass? Let's write them in increasing order. What must we multiply 1 g by to get 1 kg?<br>Elicit that: BB: 1 kilogram = 1000 grams<br>d) What are the standard units of money? (£ and pence). What must we multiply 1 p by to get £1? (100)<br>Elicit that: BB: 1 p = 1 hundredth of £1<br>*6 min* | Whole class activity<br>Praise all contributions.<br>Ps dictate to T or come to BB to write in order.<br>Agreement, praising<br>T writes responses on BB<br>Discuss meanings of 'milli', 'centi' and 'kilo'<br>[T could mention 'deci' meaning '1 tenth' but unit only used abroad, e.g. decimetre (dm) ]<br>At a good pace throughout<br>BB:<br>1 ml < 1 cl < 1 ℓ<br>×10 ×100<br>BB: 1 g < 1 kg<br>×1000<br>BB: 1 p < £1<br>×100 |
| **2** | **Sequences**<br>Continue these sequences.<br>a) The first term is 321 cl and the sequence is decreasing by 20 cl.<br>(321 cl, 301 cl, 281 cl, 261 cl, 241 cl, 221 cl, 201 cl, 181 cl, . . .)<br>b) The first 4 terms are:<br>1 mm, 2 mm, 4 mm, 8 mm, (16 mm, 32 mm, 64 mm, . . .)<br>What is the rule? (Every following term is twice the previous one.)<br>c) The first 3 terms are:<br>1 kg 27 g, 1 kg 127 g, 1 kg 227 g, (1 kg 327 g, 1 kg 427 g, . . .)<br>What is the rule? (Every term is 100 g more than the previous one.)<br>*10 min* | Whole class activity<br>At speed round class.<br>If a P makes a mistake, the next P corrects it.<br>T helps with part b)<br>Agreement on the rules<br>Praising, encouragement only<br>In good humour! |
| **3** | **Writing quantities**<br>T writes a quantity on BB. Ps write it in different ways in their *Ex. Bks.* Review orally with whole class. Mistakes corrected.<br>e.g. a) 125 cl = (1250 ml = 1 ℓ 250 ml = 1 ℓ 25 cl = 1.25 ℓ)<br>b) 18 cm 2 mm = (182 mm = 18.2 cm)<br>c) 1245 mm = (1 m 245 mm = 1 m 24 cm 5 mm = 124 cm 5 mm = 124.5 cm = 1.245 m)<br>d) 71 kg 600 g = (71.6 kg) e) £49 70 p = (£49.70 = 4970 p)<br>Let's write some in the place value table. Ps choose the units.<br>*15 min* | Individual work first, then whole class filling in of table.<br>Draw on BB or use copy master<br>BB: e.g. |

| | Th | H | T | U | t | h | th | |
|---|---|---|---|---|---|---|---|---|
| a) | | | | 1 | 2 | 5 | | ℓ |
| b) | | | 1 | 8 | 2 | | | cm |
| c) | 1 | 2 | 4 | 5 | | | | mm |
| d) | | | 7 | 1 | 6 | (0) | (0) | kg |
| e) | | | 4 | 9 | 7 | 0 | | £ |

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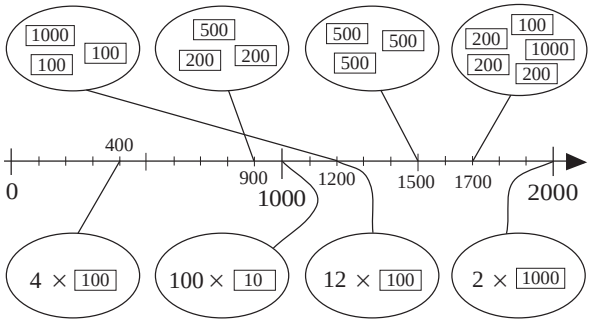
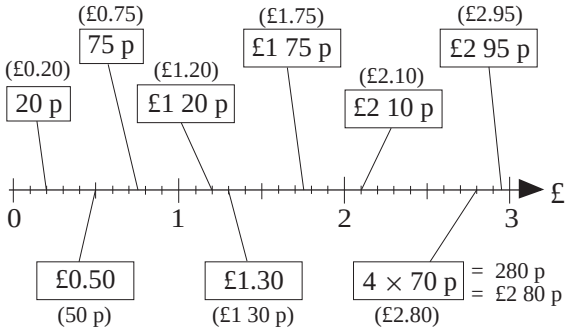
# Y3

*Lesson Plan 83*

| *Activity* | | *Notes* |
|---|---|---|
| **4** | **Number line**<br>Let's join the amounts to the corresponding points on the number line. Elicit that the ticks on the number line show every 100 from 0 to 2000.<br>Ps come out to choose a quantity and join it up, explaining reasoning. Class agrees/disagrees.<br>BB:<br>  <br><br>*20 min* | Whole class activity<br>Drawn on BB or use enlarged copy master or OHP<br>At a good pace<br>Discussion, reasoning, agreement, praising<br>Feedback for T<br><br>**Extension**<br>P points to a number not yet specified and other Ps say how it could be made up. |
| **5** | **Money**<br>What can you tell me about this number line? (It shows money from £0 to £3, with ticks at every 10 p). Let's join up the sums of money to the correct place on the number line.<br>Ps come out to choose a sum of money and join it up, explaining reasoning. Class agrees/disagrees.<br>BB:<br>  <br><br>How could we write them in a place value table? Elicit that the tens column would show £10s (but none in this question), the units column would show £1s, the tenths column would show 10 p's (1 tenth of a £) and the hundredths column would show 1 p's (1 hundredth of a £).<br>T writes what Ps dictate, or Ps come to BB to write amounts in table.<br>*25 min* | Whole class activity<br>Drawn on BB or use enlarged copy master or OHP<br>At a good pace<br>Reasoning, agreement, praising<br>Table drawn on BB or OHT<br>BB:<br>£ p<br>T U t h<br>0 2 0<br>0 7 5<br>1 2 0<br>1 7 5<br>2 1 0<br>etc.<br>Reasoning, agreement, praising |
| **6**<br><br><br><br><br><br>**Extension** | ***PbY3b, page 83***<br>Q.1 Read: *How much money is in each picture? Write the amount in pence.*<br>Make sure that Ps realise they have to write 1 digit in each box, i.e. number of 1 p coins in the units column, number of 10 p coins in the tens column and number of £1 coins (100 p) in the hundreds column.<br>Review at BB with whole class. Mistakes corrected.<br>In what other ways could we write these amounts of money? Ps come to BB. Class agrees/disagrees.<br>*30 min* | Individual work, monitored, helped<br>Drawn on BB or use enlarged copy master or OHP<br>Reasoning, agreement, self-correction, praising<br>*Solution*:<br>a) 452 p b) 1402 p c) 1035 p<br>£4 52 p £14 2 p £10 35 p<br>£4.52 £14.02 £10.35 |

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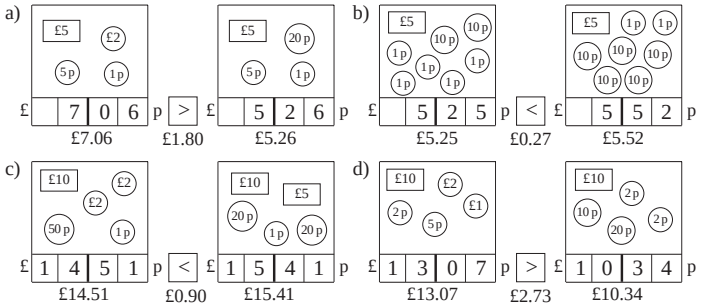
# Y3

*Lesson Plan 83*

| *Activity* | | *Notes* |
|---|---|---|
| **7** | ***PbY2b, page 83***<br>Q.2 Read: *How much money is in each box?*<br>*Which box in each pair has more?*<br>Do part a) on BB with the whole class first. Make sure that Ps realise that the thick line separates the £s from the pence (and is also where the decimal point would be).<br>Rest done as individual work. Review at BB with whole class. Discuss and correct all mistakes.<br>*Solution:*<br>  <br><br>*35 min* | Individual work, monitored, helped<br>Drawn on BB or use enlarged copy master or OHP<br>Reasoning, agreement, self-correction, praising<br>**Extension**<br>Who can write each amount as a decimal?<br>How much more is the bigger amount?<br>T writes what Ps dictate, or Ps come to BB<br>Agreement, praising |
| **8** | ***PbY3b, page 83***<br>Q.3 Read: *Exchange the money for 1 p coins.*<br>Review at BB with whole class. Mistakes discussed and corrected.<br>*Solution*:<br>a) 8 (10p) = 80 (1p) b) 8 (£1) = 800 (1p)<br>c) 12 (10p) = 120 (1p) d) 12 (£1) = 1200 (1p)<br>*38 min* | Individual work, monitored, (helped)<br>Agreement, self-correction, praising<br>If problems, show on BB, e.g. d) 12 × 100 p = 1200 p and/or on place value table. |
| **9** | ***PbY3b, page 83***<br>Q.4 Read: *Exchange the money for 10 p coins.*<br>Review at BB with whole class. Mistakes discussed and corrected.<br>*Solution*:<br>a) 60 (1p) = 6 (10p) b) 9 (£1) = 90 (10p)<br>c) 180 (1p) = 18 (10p) d) 10 (£1) = 100 (10p)<br>e) 900 (1p) = 90 (10p) f) 12 (£1) = 120 (10p)<br>*41 min* | Individual work, monitored, (helped)<br>Agreement, self-correction, praising<br>Feedback for T<br>If problems, show on place value table |
| **10** | ***PbY3b, page 83***<br>Q.5 Read: *Exchange the money for £1 coins.*<br>Review at BB with whole class. Mistakes discussed and corrected.<br>*Solution*:<br>a) 100 (1p) = 1 (£1) b) 60 (10p) = 6 (£1)<br>c) 900 (1p) = 9 (£1) d) 100 (10p) = 10 (£1)<br>e) 1400 (1p) = 14 (£1) f) 150 (10p) = 15 (£1)<br>*45 min* | Individual work, monitored, (helped)<br>Agreement, self-correction, praising<br>Feedback for T<br>N.B. Activites 8, 9 and 10 could be done as a whole class activity using response 'slates' |

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# Y3

R: Mental calculation
**C: Calculating with quantities**
*E: Numbers up to 2000*

## *Lesson Plan* *84*

| *Activity* | | *Notes* |
|---|---|---|
| **1** | **Writing numbers**<br>T says a number; Ps write it in *Ex. Bks*. in different ways. Review at BB with whole class. Discuss all cases. Class agrees/disagrees.<br>e.g.<br>• Nine hundred and sixty eight = (968 = 900 + 60 + 8<br>= 9 × 100 + 6 × 10 + 8 × 1 = 9H + 6T + 8U)<br>Repeat for:<br>• Seven hundred and ninety three =<br>• Six hundred and seven =<br>• One thousand, two hundred and thirty =<br>• One thousand, nine hundred and fifty four =<br>• One thousand and seventy six =<br>• One thousand and three =<br>As each number is reviewed, Ps write it in a place value table on BB.<br>*6 min* | Individual work, monitored.<br>T has SB or BB or OHT already prepared with the numbers written in words<br>Agreement, self-correction, praising<br>BB:<br>Agreement, praising |
| **2** | **Competition**<br>T divides class into 3 or 4 teams (of roughly equal ability). Each team chooses a 3-digit number. T writes them on different parts of the BB (or on SB, flip charts, or large sheets of paper stuck to wall).<br>I will give you 3 minutes to write as many different ways as you can to describe your number. You must start and stop when I say.<br>Start ... now! Ps from each team come to BB one after another to write different descriptions. Rest of team correct their team-mates' errors, point out repetitions and note ideas from other teams. . . . Stop!<br>Review each team's descriptions. The team with most correct statements is the winner. If two teams have the same number of statements, the class chooses the team with the most creative descriptions as the winner.<br>*11 min* | Whole class activity<br>At a good pace<br>e.g. 160<br>80 × 2<br>70 + 90<br>320 ÷ 2<br>1H + 6T<br>1 tenth of 1600<br>200 – 40<br>etc.<br>Class applauds the winners |
| **3** | **Secret quantity**<br>I am thinking of a quantity. You must ask me questions to find out what it is. I can answer only Yes or No.<br>e.g. 1420 cm: Is it a capacity? (No), Is it a length? (Yes) Is it in km? (No), Is it in m? (No), Is it in cm? (Yes) Is it more than 100 cm? (Yes), Is it less than 1000 cm? (No), Is it more than 2000 cm? (No), Is it less than 1500 cm? (Yes), Is its hundreds digit even? (Yes) Is its hundreds digit 2? (No), Is it more than 1450 cm? (No) Is it a whole ten? (Yes) Is its tens digit even? (Yes) Is its tens digit 2? (Yes) It is 1420 cm. Yes!<br>*16 min* | Whole class activity<br>Ps can make notes in *Ex. Bks*<br>Encourage Ps to ask logical questions and to keep in mind clues already given<br>Involve majority of class<br>Praise clever questions<br>Ps say when questions are not very good and why. |
| **4** | ***PbY3b, page 84***<br>Q.1 Read: *Fill in the missing values.*<br>Deal with one part at a time. Review at BB with whole class.<br>*Solution*: a) 200 ℓ, 560 ℓ, 80 ℓ, 360 ℓ, + 280 ℓ, 640 ℓ, + 80 ℓ, 440 ℓ, 200 ℓ; b) 400 kg, 320 kg, 70 kg, 720 kg, – 470 kg, 250 kg, 70 kg, 650 kg, 400 kg<br>*21 min* | Individual work, monitored, helped<br>Use enlarged copy master/ OHP<br>Reasoning, agreement, self-correction, praising<br>Discuss whether Ps think it is easier to add the tens or the hundreds first. |

| Th | H | T | U |
|---|---|---|---|
| | 9 | 6 | 8 |
| | 6 | 0 | 7 |
| 1 | 2 | 3 | 0 |
| 1 | 9 | 5 | 4 |
| 1 | 0 | 7 | 6 |
| 1 | 0 | 0 | 3 |

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# Y3

*Lesson Plan 84*

| *Activity* | | *Notes* |
|---|---|---|
| **5** | **Inequalities**<br>T has BB already prepared. Which is more? How much more?<br>Ps come to BB to fill in the missing sign and to write the difference below it, explaining reasoning. Class agrees/disagrees.<br>BB:<br>a) 300 cl + 400 cl (700 cl) [<] (100 cl) 300 cl + 500 cl (800 cl)<br>b) 600 g + 700 g (1300 g) [>] (100 g) 500 g + 700 g (1200 g)<br>c) 400 m + 800 m (1200 m) [=] 500 m + 700 m (1200 m)<br>d) 900 ml – 500 m (400 ml) [>] (100 ml) 900 ml – 600 ml (300 ml)<br>e) 1300 cm – 600 cm (700 ml) [=] 1400 cm – 700 cm (700 ml)<br>f) 1500 ℓ – 800 ℓ (700 ℓ) [>] (200 ℓ) 1400 ℓ – 900 ℓ (500 ℓ)<br>*26 min* | Whole class activity<br>Written on BB or use enlarged copy master or OHP<br>Reasoning, agreement, praising<br>Extra praise if a P reasons without needing to work out each side of the inequality<br>Which quantities could be written in another way?<br>e.g. 300 cl = 3 ℓ,<br>700 g = 0.7 kg,<br>1400 cm = 14 m, etc.<br>Agreement, praising |
| **6** | ***PbY3b, page 84***<br>Q.2 Read: *Fill in the missing quantities to make the equations correct.*<br>Let's see how many of these you can do in 2 minutes!<br>Review at BB with whole class. Mistakes discussed and corrected. Ps explain how they worked out the answers (with or without calculation, e.g. 360 cm is 10 cm more than 350 cm, so missing value must be 10 cm less than 260 cm, i.e. 250 cm).<br>*Solution*:<br>a) 260 cm + 350 cm = 360 cm + 250 cm (260 cm – 10 cm)<br>b) 190 g + 470 g = 480 g + 180 g (470 g + 10 g)<br>c) 470 ml + 280 ml = 480 ml + 270 ml (280 ml – 10 ml)<br>d) 260 m + 340 m = 431 m (600 m) + 169 m (600 m – 100 m – 60 m – 9 m)<br>e) 750 ℓ – 160 ℓ = 740 ℓ – 150 ℓ (160 litres – 10 litres)<br>f) 630 mm – 470 mm = 640 mm – 480 mm (630 mm + 10 mm)<br>*31 min* | Individual work, monitored, helped<br>Written on BB or use enlarged copy master or OHP<br>Calculations can be done at side of *Pb* or in *Ex. Bks* – but Ps should be encouraged to notice whether it can be solved without working out the value of the given side.<br>(only part d) needs to be calculated)<br>Reasoning, agreement, self-correction, praising<br>Discuss other ways the values could have been written, e.g. 630 mm = 63 cm |
| **7** | ***PbY3b, page 84***<br>Q.3 Read: *Bella's piece of ribbon is 800 cm longer than Anne's. What length of ribbon could they each have? Complete the table and write the rule.*<br>Agree on one form of the rule. Ps complete the table.<br>Review at BB with whole class. Mistakes corrected. Ps come out to write the rule in different ways. Class agrees/disagrees.<br>What other unit could have been used in the table? (metres, mm) Agree that using metres would have made the task easier.<br>*Solution*<br>*Rule*: $A = B - 800$ cm, $B = A + 800$ cm, 800 cm $= B - A$<br>*36 min* | Individual work, monitored, helped<br>Drawn on BB or use enlarged copy master or OHP<br>Discussion, reasoning, agreement, self-correction, praising<br>e.g. 1 m + 8 m = 9 m<br>Feedback for T |

| *A* | **100 cm** | 200 cm | **300 cm** | 600 cm | **500 cm** | 1100 cm | **0 cm** | 1200 cm | **700 cm** |
|---|---|---|---|---|---|---|---|---|---|
| *B* | 900 cm | **1000 cm** | 1100 cm | **1400 cm** | 1300 cm | **1900 cm** | 800 cm | **2000 cm** | 1500 cm |

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| **Y3** | | *Lesson Plan 84* |
|---|---|---|
| ***Activity*** | | ***Notes*** |
| **8** | **Mental practice**<br>A and B have saved up £800 pounds altogether. How much could they each have? Ps stand up in pairs to be A and B. $P_1$ says how much he/she has and $P_2$ says the amount which makes it up to £800 (e.g. $P_1$: £500, $P_2$: £300; $P_3$: £750, $P_4$: £50; $P_5$: £794, $P_6$: £6, etc. Class points out errors or repetitions.<br>Who can tell me the rule? Who agrees? Who can think of another way to write it? etc.<br>(*Rule*: $A + B = £800$; $A = £800 - B$; $B = £800 - A$)<br>*40 min* | Whole class activity<br>At speed. Involve all Ps.<br>Agreement, praising<br>Encourage creativity<br>Extra praise if Ps use £s and pence!<br>If time, repeat for other total amounts |
| **9** | ***PbY3b, page 84***<br>Q.4 Read: *Write the calculations and underline the answer.*<br>Ps read the problems on their own and work out the answers.<br>Review one part at a time. Ps show answers on commmand. Ps who responded correctly explain to Ps who did not. Mistakes corrected.<br>*Solution*:<br>a) E: £700, F: £500; E + F: £700 + £500 = <u>£1200</u><br>b) i) G: £700, H: G – £500 = £700 – 500 = <u>£200</u><br>ii) G + H = £700 + £200 = <u>£900</u> | Individual work, monitored, helped<br>Written on scrap paper or on plastic response'slates'<br>Reasoning, agreement, self-correction, praising |
| **Extension** | Listen carefully and think about how you would work out the answer to this problem.<br>*Steve and Tom have £800 altogether in their bank accounts. Steve has £300 more than Tom. How much does Tom have?*<br>**X**, how would you work it out? Who agrees? Who thinks another way? etc.<br>*Most logical solution*:<br>First take off Steve's extra £300: £800 – £300 = £500<br>Steve and Tom will have equal amounts of the £500: £500 ÷ 2 = £250<br>So Tom has <u>£250</u> and Steve has £250 + £300 = <u>£550</u>.<br>*45 min* | Whole class activity<br>T repeats slowly<br>Give Ps time to think and discuss with their neighbours<br>Reasoning, agreement, praising<br>Or on one line:<br>$(£800 - \overset{£500}{£300}) \div 2 = £250$<br>*Check*: £250 + £550 = £800 |

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**Week 17**

| **Y3** | | *Lesson Plan* *85* |
|---|---|---|
| ***Activity*** | | ***Notes*** |
| | Calculation and measuring practice (length, capacity, mass).<br>*PbY3b, page 85* | |

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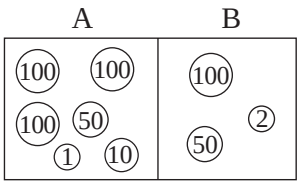
# Y3

R: Mental calculation
**C: Estimation of sums**
*E: Numbers up to 2000*

*Lesson Plan*
*86*

| *Activity* | | *Notes* |
|---|---|---|
| **1** | **Methods of Estimation 1**<br>Look at this diagram. How could we estimate the sum?<br>BB:<br>  <br><br>a) Estimate by rounding to the nearest hundred:<br>BB: A ≈ 400, B ≈ 200, A + B ≈ 400 + 200 = 600<br>A < 400 and B < 200, so A + B < 600<br>b) Estimate by rounding to the nearest ten:<br>BB: A ≈ 360, B ≈ 150, A + B ≈ 360 + 150 = 510<br>A > 360 and B > 150, so A + B > 510<br>c) BB: 360 < A < 370<br>150 < B < 160<br>so 510 < A + B < 530<br>What is the exact sum? (BB: A + B = 361 + 152 = 513)<br>Which method do you think is best? (rounding to the nearest 10)<br>*5 min* | Whole class activity<br>Drawn on BB or use model coins stuck to BB.<br>Ps suggest how to estimate<br>Class agrees/disagrees.<br>T confirms these 3 methods<br>Reasoning, agreement, praising<br>Ps copy into *Ex. Bks.*<br>(510 + 1 + 2)<br>Discussion, agreement, praising |
| **2** | **Methods of Estimation 2**<br>Listen carefully and think how you could estimate the sum.<br>*In a shop window there is a dinosaur for £3 21 p and a teddy bear for £2 15 p. Estimate how much we would need to save if we wanted to buy both of them.*<br>What could we do to make it easier for us? (Change the £s and pence into pence.) BB: D = 321 p and T = 215 p<br>a) Estimation after rounding to the nearest 100 p (£) :<br>BB: D ≈ 300 p (= £3), T ≈ 200 p (= £2),<br>D + T ≈ 300 p + 200 p = 500 p (= £5)<br>D > 300 p and T > 200 p, so D + T > 500 p<br>b) Estimation after rounding to the nearest 10 p:<br>BB: D ≈ 320 p, T ≈ 220 p, D + T ≈ 320 p + 220 p = 540 p<br>D > 320 p but T < 220 p, so we can't add them.<br>c) Estimation using inequalities:<br>BB: 320 p < D < 330 p<br>210 p < T < 220 p<br>so 530 p < D + T < 550 p<br>What is the exact sum? (BB: D + T = 321 p + 215 p = 536 p<br>= £5 36 p)<br>*10 min* | Whole class activity<br>T could have soft toys to show if possible, with price tags attached<br>Ps keep in mind what they did in Activity 1.<br>Discussion, reasoning, agreement, praising<br>Feedback for T<br>Ps copy into *Ex. Bks.*<br>(4 p less than the estimate in b)<br>Agree that method b) is closest |

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difficult and why.

# Y3

*Lesson Plan 86*

| *Activity* | | *Notes* |
|---|---|---|
| **3** | **Estimation by rounding to the nearest 100**<br>Let's estimate these sums by rounding to the nearest hundred:<br>BB: a) 213 + 342 ≈ (200 + 300 = 500)<br>b) 148 + 567 ≈ (100 + 600 = 700)<br>c) 527 + 261 ≈ (500 + 300 = 800)<br>d) 354 + 369 ≈ (400 + 400 = 800)<br>Ps come out to BB, explaining reasoning. Class points out errors.<br>Which estimate is more (less) than the exact sum?<br>a) 500 < 213 + 342, as both numbers have been rounded down<br>d) 800 > 354 + 369, as both numbers have been rounded up.<br>*13 min* | Whole class activity<br>T has BB (SB or OHT or flipchart) already prepared<br>At a good pace<br>Reasoning, agreement, praising<br>Agreee that in b) and c), one number has been rounded up and the other number has been rounded down |
| **4** | **Estimation by rounding to the nearest 10**<br>Let's estimate the same sums by rounding to the nearest ten:<br>BB: a) 213 + 342 ≈ (210 + 340 = 550) (both rounded down)<br>b) 148 + 567 ≈ (150 + 570 = 720) (both rounded up)<br>c) 527 + 261 ≈ (530 + 260 = 790) (One up, one down)<br>d) 354 + 369 ≈ (350 + 370 = 720) (One down, one up)<br>Ps come out to BB, explaining reasoning. Class points out errors.<br>Which estimates are more (less) than the exact sum?<br>a) 213 + 342 > 550 b) 148 + 567 < 720<br>*16 min* | Whole class activity<br>T has copy of previous activity's sums on another SB or flipchart or OHT<br>At a good pace<br>Reasoning, agreement, praising<br>c) and d): one up and one down, so not easy to compare |
| **5** | **Estimation using inequalities**<br>Let's estimate the same sums by writing inequalities:<br>BB: a) 210 < 213 < 220<br>340 < 342 < 350<br>550 < 213 + 342 < 570<br>b) 140 < 148 < 150<br>560 < 567 < 570<br>700 < 148 + 567 < 720<br>c) 520 < 527 < 530<br>260 < 261 < 270<br>780 < 527 + 261 < 800<br>d) 350 < 354 < 360<br>360 < 369 < 370<br>710 < 354 + 369 < 730<br>Ps come out to BB, explaining reasoning. Class points out errors.<br>*20 min* | Whole class activity<br>At a good pace<br>Reasoning, agreement, praising<br>Rest of class write inequalities in *Ex. Bks* |
| **6** | ***Pby3b, page 86***<br>Q.1 Read: *a) Circle in red the 3-digit numbers in the 2nd row.*<br>*b) Circle in green the 3-digit even numbers in the 3rd column from the left.*<br>*c) Circle in yellow the 2-digit odd numbers in the 3rd row from the bottom.*<br>*d) Circle in blue the odd numbers in the 6th column from the right.*<br>Review at BB with whole class. Mistakes discussed and corrected.<br>*Solution*: a) 100, 111, 126, 135 b) 160<br>c) 11, 37, 59 d) 11, 157<br>*25 min* | Individual work, monitored<br>Drawn on BB or use enlarged copy master or OHP<br>(Practice in following instructions and even/odd)<br>Agreement, self-correction, praising<br>Feedback for T<br>What other questions could you ask about the numbers in the grid?<br>Praise creativity |

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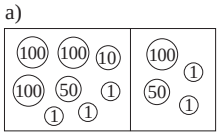
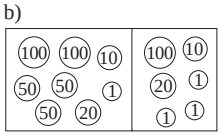
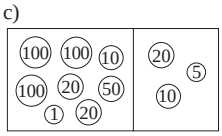
# Y3

*Lesson Plan 86*

| *Activity* | | *Notes* |
|---|---|---|
| **7** | ***PbY3b, page 86***<br>Q.2 Read: *Write additions and subtractions about each picture.*<br>Ps first write value in each part, then write the sum above the diagram by counting the coins. Then they write additions/ subtractions.<br>Review at BB with whole class. Ps dictate to T what they have written. Class agrees/disagrees or suggests alternatives.<br>Mistakes discussed and corrected and equations added where appropriate.<br>*Solution*:<br>a)  b)  c)  <br>363 + 152 = 515   381 + 133 = 514   401 + 35 = 436<br>152 + 363 = 515   133 + 381 = 514   35 + 401 = 436<br>515 – 363 = 152   514 – 381 = 133   436 – 401 = 35<br>515 – 152 = 363   514 – 133 = 381   436 – 35 = 401<br>Ps estimate sums and differences by rounding to the nearest 10.<br>*30 min* | Individual work, monitored, helped<br>Drawn on BB or use enlarged copy master or OHP (or coins stuck to BB)<br>Reasoning, agreement, self-correction, praising<br>Orally round class<br>Agreement, praising |
| **8**<br>**Extension** | ***PbY3b, page 86***<br>Q.3 Read: *Estimate the sums by rounding the numbers to the nearest whole ten.*<br>Review at BB with whole class. Mistakes corrected. Elicit whether exact sum will be more or less than the estimate.<br>What <u>is</u> the exact sum?<br>*Solution*:<br>a) 471 + 384 ≈ 470 + 380 = 850 (471 + 384 > 850)<br>b) 326 + 75 ≈ 330 + 80 = 410 (326 + 75 < 410)<br>c) 1365 + 524 ≈ 1370 + 520 = 1890<br>d) 1723 + 255 ≈ 1720 + 260 = 1980<br>• Estimate the sums by rounding numbers to the nearest hundred.<br>a) 471 + 384 ≈ 500 + 400 = 900<br>b) 326 + 75 ≈ 300 + 100 = 400<br>c) 1365 + 524 ≈ 1400 + 500 = 1900<br>d) 1723 + 255 ≈ 1700 + 300 = 2000<br>• Estimate the sums by writing inequalities.<br>a) 470 < 471 < 480<br>380 < 384 < 390<br>850 < sum < 870<br>b) 320 < 326 < 330<br>70 < 75 < 80<br>390 < sum < 410<br>c) 1360 < 1365 < 1370<br>520 < 524 < 530<br>1880 < sum < 1900<br>d) 1720 < 1723 < 1730<br>250 < 255 < 260<br>1970 < sum < 1990<br>*36 min* | Individual work, monitored, helped<br>Reasoning, agreement, self-correction, praising<br><u>Exact sums</u><br>a) 471 + 384 = 855<br>b) 326 + 75 = 401<br>c) 1365 + 524 = 1889<br>d) 1723 + 255 = 1978<br>Orally round class<br>Agreement, praising<br>Ps come out to BB to write inequalities.<br>(3 Ps per sum, 1 row each. 4 Ps can work on different parts of the BB at once.)<br>At a good pace.<br>Agreement, praising |

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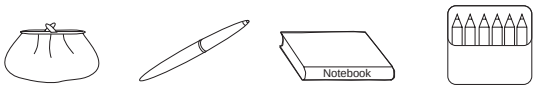
# Y3

*Lesson Plan 86*

| *Activity* | | *Notes* |
|---|---|---|
| **9** | ***PbY3b, page 86*** | Individual work, monitored, helped |
| | Q.4 Read: *Katy went shopping.* | (Do first part with whole class first if necessary) |
| | *a) Estimate to the nearest £ how much she spent if she bought:* | Drawn on BB (or pictures from magazines cut out and stuck to BB) or use enlarged copy master or OHP |
| | *i) the pen and the book* | |
| | *ii) the purse and the pencils.* | |
| | *b) Estimate to the nearest 10 p how much she spent if she bought:* | |
| | *i) the purse and the pen* | |
| | *ii) the book and the pencils.* | |
| | Review with whole class. Mistakes discussed and corrected | Reasoning, agreement, self-correction, praising |
| | What would the prices be using only £s? | Whole class activity |
| | BB:   | Ps come to BB to write decimals below prices. |
| | £5 73 p (£5.73) £4 58 p (£4.58) £3 12 p (£3.12) £2 36 p (£2.36) | Agreement, praising |
| | *Solution*: | |
| | a) i) £4 58 p + £3 12 p ≈ £5 + £3 = <u>£8</u> | |
| | ii) £5 73 p + £2 36 p ≈ £6 + £2 = <u>£8</u> | |
| | b) i) £5 73 p + £4 58 p ≈ £5 70 p + £4 60 p = £9 + £1 30 p = <u>£10 30 p</u> | |
| | ii) £3 12 p + £2 36 p ≈ £3 10 p + £2 40 p = <u>£5 50 p</u> | |
| **Extension** | What could she have bought if we know that she spent: | Reasoning, agreement, praising |
| | a) between £8 and £10? (purse and book: £8 85 p, or purse and pencils: £8 09 p) | (Ps can do calculations on 'slates' or in *Ex. Bks.)* |
| | b) between £6 and £8? (pen and pencils: £6 94 p; or pen and book: £7 70 p) | |
| | *45 min* | |

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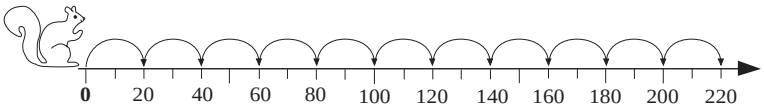
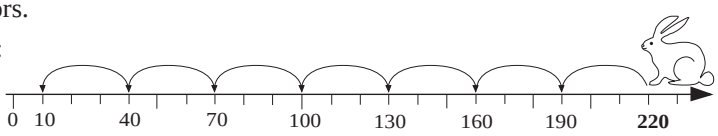
# Y3

R: Mental calcuation

**C: Estimation and addition of sums (mentally)**

*E: Numbers up to 2000*

## *Lesson Plan* *87*

| *Activity* | | *Notes* |
|---|---|---|
| **1** | **Jumps along the number line**<br>• Let's start at zero and count up 20 at a time. (0, 20, 40, . . ., )<br>• Let's start at 250 and count down 30 at a time. (250, 220, 190, . . | Whole class activity<br>In unison. At speed<br>In unison. At speed |
| | *Squirrel* starts at zero and jumps 20 units each time. Let's draw his jumps on the number line and label the numbers he lands on. Ps come to BB to draw jumps and write numbers. Class points out errors.<br>BB:<br>  <br> | Use class number line with cut-out animals on straws, or use enlarged copy master or OHP<br>Demonstration, agreement, praising |
| | *Rabbit* starts at 220 and jumps 30 units at a time back along the number line. Let's draw his jumps and label the numbers he lands on.<br>Ps come to BB to draw jumps and write numbers. Class points out errors.<br>BB:<br>  <br> | Ask what happens when *Rabbit* reaches 10. Allow Ps to explain if they can.<br>Discussion, demonstration on negative part of number line |
| | Let's make a table about it and write in the data. T and Ps discuss how to draw the table .<br>BB: | Ps suggest what to do.<br>T draws on BB (use BB ruler) and Ps draw in *Ex. Bks*. (using rulers). |

| Number of jumps | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 20 | 40 | 60 | 80 | 100 | 120 | 140 | 160 | 180 | 200 | 220 |
| | 220 | 190 | 160 | 130 | 100 | 70 | 40 | 10 | (– 20) | (– 50) | (– 80) | (– 110) |

| | |
|---|---|
| | Show the last 4 columns for *Rabbit* on a number line. (Draw on BB or extend copy master.) Agree on negative values. Ps complete table in *Ex. Bks*. First P finished comes out to BB to complete T's table.<br>Is he/she correct? Who had different values? etc. Mistakes corrected. |
| | *8 min* |
| **2** | **Sharing**<br>I want to share £300 equally among 5 children. How could I do it?<br>Ask several Ps what they think. (e.g. Give £1 to each child in turn but agree that this would take a very long time.) Who can think of a shorter way to do it? (e.g. Give £10 to each child in turn.)<br>Let's show it in a table. Ps come out to complete table.<br>BB: |

| | |
|---|---|
| Anne | 10 10 |
| Ben | 10 |
| Cathy | 10 |
| David | 10 |
| Ella | 10 |

| | |
|---|---|
| | or P might suggest division:<br>BB: £300 ÷ 5 = £60<br>or<br>5 × £60 = £300 |
| | *11 min* |

| | |
|---|---|
| | Individual work, monitored<br>Discussion, reasoning, agreement, self-correction, praising |
| | Whole class activity<br>Reasoning, agreement, checking, praising<br>Use names of Ps in class.<br>T starts drawing, Ps come to BB to continue it (or stick on model money)<br>Extra praise if a P suggests division first of all.<br>Accept any correct method<br>If Ps have no ideas, T explains the different ways. |

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# Y3

*Lesson Plan 87*

| *Activity* | | *Notes* |
|---|---|---|
| **3** | **Written exercises**<br>Do these calculations in your *Ex. Bks*. T dictates the numbers.<br>Review after each part orally with whole class. Mistakes discussed and corrected. Write on BB only if there are problems.<br>a) 60 + 90 = (150); 50 + 80 = (130); 160 + 20 = (180)<br>b) 60 – 40 = (20); 130 – 70 = (60); 160 – 90 = (70)<br>c) 700 + 800 = (1500); 1400 + 300 = (1700); 1600 + 200 = (1800)<br>d) 600 – 400 = (200); 900 – 300 = (600); 1300 – 700 = (600)<br>e) 120 + 200 = (320); 460 + 280 = (740); 670 + 330 = (1000)<br>f) 620 – 400 = (220); 910 – 370 = (540); 1260 – 340 = (920)<br>g) 6 × 30 = (180); 5 × 40 = (200); 9 × 50 = (450)<br>h) 160 ÷ 8 = (20); 180 ÷ 9 = (20); 320 ÷ 4 = (80)<br>*23 min* | Individual work<br>T could have SB or OHT already prepared in case of difficulties<br>Reasoning, agreement, self-correction, praising<br>If problems, Ps explain how they did the calculations<br>Elicit that there are $8 \times 3 = 24$ operations<br>Who had 24 correct? Who had more than 20 (less than 20) correct?<br>What were your mistakes? etc.<br>T notes Ps having difficulties<br>Stars, stickers, etc awarded. |
| **4** | ***PbY3b, page 87, Q.1***<br>Read: *Estimate by using values rounded to the nearest 10 p.*<br>*Find the exact amount in the picture and compare it with your estimate.*<br>Practice rounding. T says an amount, Ps round to nearest 10 p. T elicits the meaning of the ≈ sign. (approximately or nearly equal to)<br>Do part a) on BB with whole class first. Part b) can be done as individual work, reviewed if T thinks Ps understand. Otherwise continue as whole class activity. Ps come out to BB to explain and demonstrate. Class agrees/disagrees.<br>a) Read: *Liz had £1 53 p in her piggy bank. She was given another £3 48 p. How much does she have in her piggy bank now?*<br>BB: Had (money in pig): £1 53 p ≈ £1 50 p<br>Was given (money outside pig): £3 48 p ≈ £3 50 p } = £5<br>Now has (all money in diagram): £5 1 p ≈ £5<br>£5 1 p > £5 (1 p)<br>b) Read: *Brian has £3 55 p. Carolyn has £1 13 p more than Brian. How much does Carolyn have?*<br>BB: Brian (money in LH pig): £3 55 p ≈ £3 60 p<br>Carolyn (B + money outside): £4 68 p ≈ £4 70 p<br>£4 68 p < £4 70 p (2 p)<br>*30 min* | Whole class activity to start<br>Drawn on BB or use enlarged copy master or OHP<br>At speed round class. Praising<br>Discussion, demonstration, reasoning, agreement, praising<br>BB: £1 53 p + £3 48 p = £4 93 p + 7 p + 1 p = £5 + 1 p<br>Ps copy into *Pbs* too<br>Individual work, monitored, helped<br>Elicit that £3 55 p rounds up<br>Ps draw C's money in her pig<br>BB: £3 55 p + £1 13 p = £4 55 p + 13 p = £4 68 p<br>Agreement, praising |

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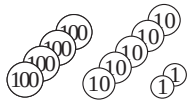
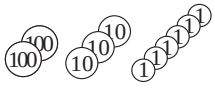
# Y3

*Lesson Plan 87*

| *Activity* | | *Notes* |
|---|---|---|
| **5** | ***PbY3b, page 87***<br>Q.2 Read *Estimate each amount to the nearest 10 p. Then write down the exact amount.*<br>T explains task, relating amounts to two pupils in class (e.g. Alan and Brian) Elicit that the amounts are shown in pence so Ps should write the answers in pence (adding 'p' after the amount).<br>Review at BB with whole class. Ps come out to write their solutions, explaining reasoning. Class agrees/disagrees.<br>Are the estimates more or less than the exact amount? Who can write the correct signs between them.<br>What would each of the amounts be in £s? (decimal notation)<br>*Solution*:<br>A:  ≈ Estimate 450 p (£4.50) < Exact amount 452 p (£4.52)<br>B:  ≈ Estimate 240 p (£2.40) > Exact amount 236 p (£2.36)<br>A + B: ≈ Estimate 690 p (£6.90) > Exact amount 688 p (£6.88)<br>*35 min* | Individual work, monitored, helped<br>Drawn on BB or use enlarged copy master or OHP<br>Initial discussion about context<br>Reasoning, agreement, self-correction, praising<br>Whole class activity<br>Ps come to BB or T writes what Ps dictate.<br>Agreement, praising<br>Elicit that the estimates are quite close to the correct answer.<br>Agree that estimating is a quick way to check that answers make sense. |
| **6** | ***PbY3b, page 87***<br>Q.3 Read: *How can the butterfly get to the flower? Calculate the length of possible routes.*<br>Elicit the units used (m, cm) and that 100 cm = 1 m (BB).<br>Talk about the fact that the diagram is not drawn to scale, so the lengths cannot be measured, only calculated.<br>Ps do calculations in *Pbs* (using m, m + cm or cm as the units).<br>How long is the shortest (longest) route. Show me . . . now! (7 m 72 cm, 9 m 54 cm)<br>Ps explain how they got their answers. Mistakes discussed and corrected.<br>*Solution*: e.g. using cm<br>1. 532 cm + 240 cm = <u>772 cm</u> = 7 m 72 cm<br>2. 532 cm + 111 cm + 212 cm = <u>855 cm</u> = 8 m 55 cm<br>3. 603 cm + 212 cm = <u>815 cm</u> = 8 m 15 cm<br>4. 603 cm + 111 cm + 240 cm = <u>954 cm</u> = 9 m 54 cm<br>*40 min* | Individual work, monitored, helped<br>Drawn on BB or use enlarged copy master or OHP<br>Discussion, agreement,<br>Demonstration<br>Written on scrap paper or 'slates'. Shown in unison<br>Reasoning, agreement, self-correction, praising<br>(4 possible routes) |
| **7** | **Problem**<br>Listen carefully, do the calculation in your *Ex. Bks* if you need to, then show me the answer when I say.<br>*Emma has £125 and Diane has £352. How much money do they have altogether?*<br>Show me . . . now! (£477) **X**, explain to us how you worked it out. Who agrees? Who did it another way? etc. (e.g adding hundreds first, then tens, then units; or adding units first, then tens, then hundreds)<br>*45 min* | Whole class activity<br>T repeats slowly and Ps repeat in own words.<br>Written on scrap paper/slates<br>In unison.<br>Reasoning, agreement, praising<br>Show in a place value table. |

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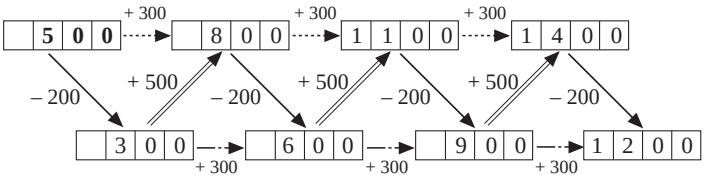
# Y3

R: Mental calculation. Quantities

**C: Addition. Pencil and paper methods. HTU + (H)TU**

*E: Numbers up to 2000*

## *Lesson Plan* *88*

| *Activity* | | *Notes* |
|---|---|---|
| **1** | **Puzzle**<br>Study this puzzle. The ⟶ arrow means – 200 and the ⟹ arrow means + 500. What are the missing numbers?<br>What do the ⋯▸ and –·–▸ arrows mean?<br>BB:<br>  <br><br>Ps come to BB to write in missing numbers and operations.<br>Elicit that subtracting 200, then adding 500 is the same as adding 300, and that the ⋯▸ and –·–▸ arrows both mean + 300.<br>*5 min* | Whole class activity<br>Drawn on BB or use enlarged copy master or OHP<br>Reasoning, agreement, praising<br>Feedback for T<br>**Extension**<br>If all the arrows pointed in the opposite direction, what would the arrows mean? |
| **2** | **Competition**<br>T divides class into 3 or 4 teams (of roughly equal ability). T writes a number for each team on different parts of the BB (or on SB, flip chart, or large sheets of paper stuck to wall).<br>I will give you 3 minutes to write as many different ways as you can to describe your number. You must start and stop when I say.<br>Start ... now! Ps from each team come to BB one after another to write different descriptions. Rest of team correct their team-mates' errors, point out repetitions and note ideas from other teams. . . . Stop!<br>Review each team's descriptions. The team with most correct statements is the winner. If two teams have the same number of statements, the class chooses the team with the most creative descriptions as the winner.<br>*10 min* | Whole class activity<br>At a good pace<br>e.g. 342<br>300 + 42<br>100 + 121 × 2<br>171 × 2<br>3H + 4T + 2U<br>684 ÷ 2<br>150 + 192<br>etc.<br>Class applauds the winners |
| **3** | **Written exercises**<br>Do these calculations in your *Ex. Bks*. T dictates the numbers.<br>a) 140 + 30 = (170); 110 – 50 = (60); 500 + 800 = (1300); 900 – 400 = (500)<br>b) 57 + 62 = (119); 84 + 57 = (141); 62 – 40 = (22); 91 – 37 = (54)<br>c) 670 + 220 = (890); 330 + 670 = (1000); 1000 – 280 = (720); 1400 – 680 = (720)<br>d) 6 × 300 = (1800); 7 × 200 = (1400); 70 × 8 = (560); 1200 ÷ 3 = (400)<br>Review after each part with the whole class. Ps explain how they did the calculations. Mistakes discussed and corrected.<br>Write details of difficult calculations on the BB.<br>e.g. 57 + 62 = 57 + 60 + 2 = 117 + 2 = 119, or<br>(50 + 50 + 10) + (7 + 2) = 110 + 9 = 119<br>91 – 37 = 91 – 30 – 7 = 61 – 1 – 6 = 54, or<br>91 – 37 = 91 – 31 – 6 = 60 – 6 = 54<br>1400 – 680 = 1400 – 600 – 80 = 800 – 80 = 720, or<br>1400 – 680 = 1400 – 700 + 20 = 700 + 20 = 720<br>*18 min* | Individual work<br>T could have SB or OHT already prepared in case of difficulties<br>Reasoning, agreement, self-correction, praising<br>Ps explain how they did the calculations.<br>Elicit that there are 4 × 4 = 16 operations.<br>Who had 16 correct? Who had more than 12 (less than 10) correct?<br>What were your mistakes? etc.<br>T notes Ps having difficulties<br>Stars, stickers, etc awarded. |

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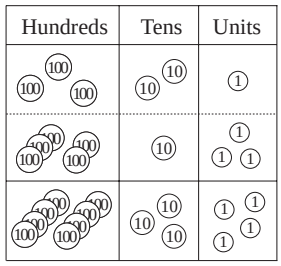
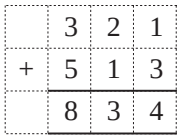
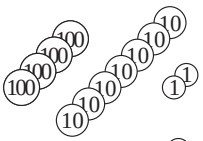
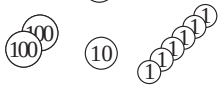
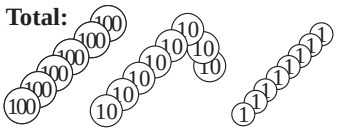
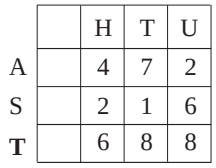
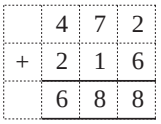
# Y3

*Lesson Plan 88*

| *Activity* | | *Notes* |
|---|---|---|
| **4** | **Vertical addition**<br>Let's add two 3-digit numbers, 321 and 513. First let's estimate the sum to give us an idea of what the final answer should be. How can we estimate? (By rounding each number to the nearest 10) | Whole class activity<br>Tables and grids drawn on BB or use enlarged copy master or OHP |
| | BB: 321 + 513 ≈ 320 + 510 = <u>830</u> | |
| | Let's show the numbers in this diagram BB:<br>T shows first number.<br>Ps come out to draw the correct number of hundreds, tens and units for the 2nd number.<br>Then they draw the total amount, explaining reasoning. Class agrees/disagrees.<br>Elicit that the total is 8H + 3T + 4U. |  <br>T demonstrates/explains by drawing or sticking coins on BB<br>At a good pace<br>T helps Ps where necessary<br>Reasoning, agreement, praising |
| | Let's write it in a place value table. Ps come out to write the digits. Class agrees/disagrees. T explains how to add vertically. | With T's help if ncesssary |
| | 1. First we add the units.<br>1 Unit + 3 Units = 4 Units<br>2. Then we add the tens.<br>2 Tens + 1 Ten = 3 Tens<br>3. Then we add the hundreds<br>3 Hundreds + 5 Hundreds = 8 Hundreds<br>Let's read the sum: 'eight hundred and thirty four'.<br>Agree that 834 ≈ 830, so answer is probably correct. | BB:<br>H T U<br>3 2 1<br>5 1 3<br>8 3 4<br>T explains and asks whether anyone does not understand.<br>In unison |
| | We can write the table in a shorter way like this.<br>Does it matter whether we add up or down?<br>(No because in addition the order does not matter.)<br>We can check it by adding in the <u>opposite</u> direction. |  <br>Discussion, agreement<br>e.g. Calculation ↓ Check ↑ |
| | *24 min* | |
| **5** | ***PbY3b, page 88, Q.1***<br>Read: *How much money do the two children have altogether? Complete the drawing, then estimate, calculate and check the answer.*<br>Work through solution as in previous activity. Ps come out to BB to draw, write and explain (with T's guidance) and class points out errors.<br>Rest of pupils write in *Pbs*. | Whole class activity<br>Drawn on BB or use enlarged copy master or OHP<br>At a good pace<br>Reasoning, agreement, praising |
| | BB:<br>Alice:  ≈ *Estimation* 4 7 0<br>Sam:  ≈ *Estimation* 2 2 0<br>**Total:**  ≈ *Estimation* 6 9 0 |  <br>A 4 7 2<br>S 2 1 6<br>**T** 6 8 8<br>Whole class reading of vertical addition (down):<br>'2 Units + 6 Units = 8 Units'<br>'7 Tens + 1 Ten = 8 Tens'<br>'4 Hundreds + 2 Hundreds = 6 Hundreds'<br>Agree that 688 ≈ 690, so answer is probably correct<br>*Check* further by adding <u>up.</u> |
| | |  <br>Elicit the short way to write the table.<br>Note that no unit of money is given. What could it be? (p) |
| | *29 min* | |

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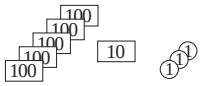
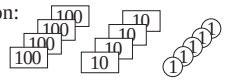
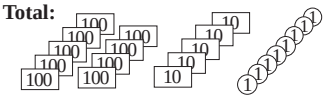
# Y3

*Lesson Plan 88*

| *Activity* | | *Notes* |
|---|---|---|
| **6** | ***PbY3b, page 88***<br>Q.2 Read: *How much money do the two children have altogether? Complete the drawing, then estimate, calculate and check the answer.*<br>Let's see if you can do this question on your own. T talks Ps through question, but Ps write own solutions in *Pbs*.<br>Review at BB with whole class. Ps come to BB to explain, draw and write. Class agrees/disagrees. Mistakes discussed and corrected.<br>*Solution:*<br>Fred:  ≈ *Estimation* 5 1 0<br>Gordon:  ≈ 4 5 0<br>**Total:**  ≈ 9 6 0<br>*Calculation*<br>F: H T U = 5 1 3<br>G: 4 4 5<br>**T**: 9 5 8<br>5 1 3<br>+ 4 4 5<br>9 5 8<br>*35 min* | Individual work, monitored, helped<br>Drawn on BB or use enlarged copy master or OHP<br>Remind Ps about checking addition in opposite direction.<br>Reasoning, agreement, self-correction, praising<br>Elicit short way of writing the addition table.<br>There are no units mentioned in this question. What do you think they are?<br>(Probably £s as they look like notes, not coins.)<br>Ps say answer as a sentence: 'The two children have £9 58 p altogether.' |
| **7** | ***PbY3b, page 88***<br>Q.3 Read: *Write the numbers in the place value table.*<br>Elicit that 'E' means Estimation'. Deal with one part at a time<br>Review at BB with whole class. Mistakes discussed and corrected.<br>*Solution:*<br>a) 136 + 312 *E:* 4 5 0 — H T U: 1 3 6 / + 3 1 2 / 4 4 8<br>b) 271 + 117 *E:* 3 9 0 — H T U: 2 7 1 / + 1 1 7 / 3 8 8<br>c) 632 + 324 *E:* 9 5 0 — H T U: 6 3 2 / + 3 2 4 / 9 5 6<br>d) 426 + 32 *E:* 4 6 0 — H T U: 4 2 6 / + 3 2 / 4 5 8<br>*40 min* | Individual work, monitored, helped<br>Written on BB or use enlarged copy master or OHP<br>Remind Ps to check sum by doing calculation in opposite direction.<br>Discussion, reasoning, agreement, checking, self-correction, praising<br>T asks Ps to come to BB to write additions in a shorter way (with or without a grid). |

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# Y3

*Lesson Plan 88*

## *Activity*

**8**

***PbY3b, page 88, Q.4***

Read: *Estimate, then calculate the sum. Write the estimate in detail.*

Elicit that *E* means *Estimation* and *C* mean *Calculation*.

Who can tell me what to do? T writes what Ps dictate.

BB: 336 + 452

*E:* 336 + 452 ≈ 340 + 450 = 790 *C:*

| | | | |
|---|---|---|---|
| | 3 | 3 | 6 |
| + | 4 | 5 | 2 |
| | 7 | 8 | 8 |

Repeat for

a) 415 + 583:

*E:* 415 + 583 ≈ 420 + 580 = 1000 *C:*

| | | | |
|---|---|---|---|
| | 4 | 1 | 5 |
| + | 5 | 8 | 3 |
| | 9 | 9 | 8 |

b) 416 + 584:

*E:* 416 + 584 ≈ 420 + 580 = 1000 *C:*

| | | | |
|---|---|---|---|
| | 4 | 1 | 6 |
| + | 5 | 8 | 4 |
| | 9 | 9 | 10 |

→

| | | | |
|---|---|---|---|
| | 4 | 1 | 6 |
| + | 5 | 8 | 4 |
| 1 | 0 | 0 | 0 |

We estimated that it is about 1000 and it is exactly 1000 (990 + 10) and 2 more than the sum in part a). How can we explain it?
Let's use a place value table.

Elicit that: 10 units = 1 ten
10 tens = 1 hundred
10 hundreds = 1 thousand

c) 416 + 585

*E:* 416 + 585 ≈ 420 + 590 = 1010 *C:*

| | | | |
|---|---|---|---|
| | 4 | 1 | 6 |
| + | 5 | 8 | 5 |
| | 9 | 9 | 11 |

→

| | | | |
|---|---|---|---|
| | 4 | 1 | 6 |
| + | 5 | 8 | 5 |
| 1 | 0 | 0 | 1 |

Elicit that this sum is 1 more than that in part c) so it is 1001.
Let's explain it in the place value table.

Elicit that: 11 units = 1 ten + 1 unit,
10 tens = 1 hundred
10 hundreds = 1 thousand

Do not worry if you do not understand. We will go over it again another day!

*45 min*

## *Notes*

Whole class activity

(or sum in *Pb* done as individual work, reviewed with whole class. Following sums done with the whole class.)

Written on BB

Ps come to BB to fill in sums explaining reasoning.

Class agrees/disagrees

Discuss what should be done now, as only 1 digit can be in each column.

Ps suggest what should be done (with T's help).

BB:

| Th | H | T | U |
|---|---|---|---|
| | 4 | 1 | 6 |
| | 5 | 8 | 4 |
| | | 1←10 | |
| | 1←10 | ↓ | ↓ |
| 1←10 | ↓ | ↓ | ↓ |
| 1 | 0 | 0 | 0 |

Again, allow Ps to try to explain (with T's help).

BB:

| Th | H | T | U |
|---|---|---|---|
| | 4 | 1 | 6 |
| | 5 | 8 | 5 |
| | | 1←11 | ↓ |
| | 1←10 | ↓ | ↓ |
| 1←10 | ↓ | ↓ | ↓ |
| 1 | 0 | 0 | 1 |

Extra praise for good ideas!

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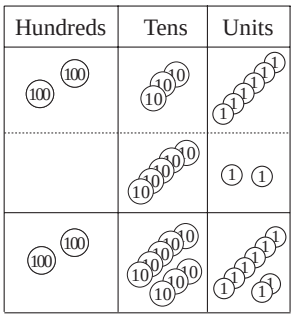
# Y3

R: Mental calculation

**C: Vertical addition, without crossing tens**

*E: Numbers up to 2000*

## *Lesson Plan* *89*

| *Activity* | | *Notes* |
|---|---|---|
| **1** | **Mental practice**<br>T says a multiplication or division, Ps give product or quotient.<br>e.g. 6 × 7, 10 × 15, 12 × 3, 60 ÷ 6, 81 ÷ 9, 140 ÷ 70, etc. | Whole class activity<br>At speed round class<br>If a P makes a mistake, next P says it correctly. |
| | *5 min* | |
| **2** | **Secret numbers**<br>What is the number I thought of? You may do any calculations in your *Ex. Bks*. Show me the number when I say.<br>a) I thought of a number. I multiplied it by 2, then subtracted 300 and got 700. What was the number I first thought of?<br>Show me . . . now! (500) **A**, tell us how you got your answer. Who did the same? Who did it another way? etc. Let's check it.<br>BB: (700 + 300) ÷ 2 = 500 *Check*: 500 × 2 – 300 = 700 ✔<br>b) I thought of a number. I added 2, then added 130 and got 300. What was the number I first thought of?<br>Show me . . . now! (168) **B**, tell us how you got your answer. Who did the same? Who did it another way? etc. Let's check it.<br>BB: 300 – 130 – 2 = 168 *Check*: 168 + 2 + 130 = 300 ✔ | Whole class activity<br>Ps show responses on scrap paper or on 'slates'.<br>In unison<br>Reasoning, agreement, praising<br>Mistakes discussed<br>In unison<br>Reasoning, agreement, praising<br>Mistakes discussed |
| | *10 min* | |
| **3** | **Problem**<br>Listen carefully, write the data, make a plan and do the calculation in your *Ex. Bks.* Show me the answer when I say.<br>*I have £320 in my bank account. I am saving £5 a week until I have enough money to buy a stereo system costing £400.*<br>*How many £5 notes will I need to save?*<br>Show me . . . now! (16) **C**, tell us how you got your answer. Who did the same? Who did it another way? etc. Let's check it.<br>BB: e.g. Have: £320 Need: £400 – £320 Save per week: £5<br>(400 – 320) ÷ 5 = 80 ÷ 5 = 50 ÷ 5 + 30 ÷ 5<br>= 10 + 6 = 16<br>*Check*: 16 × £5 + £320 = £80 + £320 = £400 ✔<br>*Answer*: I will need to save 16 £5 notes. | Individual work in *Ex. Bks*.<br>T repeats slowly. Ps repeat in own words<br>Give Ps time to think and do calculations.<br>In unison<br>Discussion, reasoning, agreement, self-correction, praising<br>Feedback for T |
| | *14 min* | |
| **4** | **Vertical addition**<br>a) Let's add 236 and 52. First let's estimate the sum. Do it in your head. **D**, what is your estimate? Who agrees? etc<br>Show the addition in a diagram, table and grid. Ps come out to BB to draw and write, explaining reasoning. T helps where necessary.<br>BB:  <br><br>E: 236 + 52 ≈ 240 + 50 = 290<br>H T U<br>2 3 6<br>5 2<br>2 8 8<br>2 3 6<br>+ 5 2<br>2 8 8<br>↓ ↑<br>(Short form) | Whole class activity<br>Tables drawn on BB or use enlarged copy master or OHP<br>Allow Ps to dictate what to do under T's guidance.<br>Agree that 288 ≈ 290.<br>Check further by doing the addition in opposite direction.<br>Reasoning, agreement, praising<br>Ps write short form in *Ex. Bks.* |

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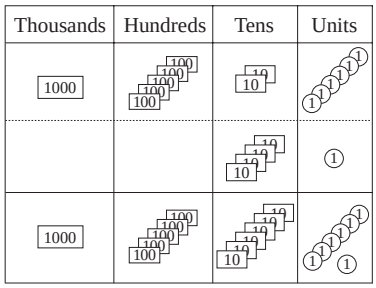
# Y3

*Lesson Plan 89*

| ***Activity*** | | ***Notes*** |
|---|---|---|
| | b) Now let's add 1526 and 41. First let's estimate the sum. Do it in your head. **F**, what is your estimate? Who agrees? etc.<br>Show the addition in a diagram, table and grid. Ps come out to BB to draw and write, explaining reasoning. T helps where necessary.<br>BB: *E*: 1526 + 41 ≈ 1530 + 40 = 1570 | Allow Ps to dictate what to do under T's guidance.<br>Reasoning, agreement, praising<br>Agree that 1567 ≈ 1570.<br>Check further by doing the addition in the opposite direction.<br>e.g. calculate ↓, check ↑ |




| Th | H | T | U |
|---|---|---|---|
| 1 | 5 | 2 | 6 |
| | | 4 | 1 |
| 1 | 5 | 6 | 7 |

| | | | | |
|---|---|---|---|---|
| | 1 | 5 | 2 | 6 |
| + | | | 4 | 1 |
| | 1 | 5 | 6 | 7 |

(Short form)

Ps write short form in *Ex. Bks.*

*20 min*

| **5** | **Checking addition**<br>*Mr. Silly* was given two additions to do for homework. This is what he wrote.<br>BB: a) 1235 + 243 b) 1342 + 53 | Whole class activity<br>T has BB or SB or OHT already prepared |
|---|---|---|

| | | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 5 |
| + | 2 | 4 | 3 | |
| | 3 | 6 | 6 | 5 |

| | | | | |
|---|---|---|---|---|
| | 1 | 3 | 4 | 2 |
| + | | 5 | 3 | |
| | 1 | 8 | 7 | 2 |

Let's check if he is correct by using estimation. Two Ps come out to estimate the sums on the BB. Class agrees/disagrees.

a) 1235 + 243 ≈ 1240 + 240 = 1480.
b) 1342 + 53 ≈ 1340 + 50 = 1390

Reasoning, agreement, praising

What do you think of *Mr. Silly*'s work? (He has made a mistake in both additions.)

Who can tell us what his mistakes are? (In both additions, the 2nd term is in the wrong place.) What numbers has he really added together? (1235 + 2430 and 1342 + 530)

Discussion, comparison of Mr. Silly's answers with estimates

Ask several Ps what they think.

Let's cross out *Mr. Silly*'s work and see if you can write the additions correctly in your *Ex. Bks.*

Individual work

Review at BB with whole class. Mistakes corrected.

Comparison with estimates.

Further checking by adding in opposite direction

*Solution*: a)

| | | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 5 |
| + | | 2 | 4 | 3 |
| | 1 | 4 | 7 | 8 |

b)

| | | | | |
|---|---|---|---|---|
| | 1 | 3 | 4 | 2 |
| + | | | 5 | 3 |
| | 1 | 3 | 9 | 5 |

Reasoning, agreement, self-correcting, praising

Feedback for T

*26 min*

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# Y3

*Lesson Plan 89*

| *Activity* | | *Notes* |
|---|---|---|
| **6** | ***PbY3b, page 89***<br>Q.1 Read: *Estimate, then calculate the sums. Write the estimates in detail.*<br>Review at BB with whole class. Mistakes corrected.<br>*Solution:*<br>a) 642 + 207 ≈ 640 + 210 = 850<br>b) 508 + 161 ≈ 510 + 160 = 670<br>c) 397 + 501 ≈ 400 + 500 = 900<br>d) 43 + 945 ≈ 40 + 950 = 990<br>*33 min* | Individual work, monitored, (helped)<br>Reasoning, agreement, checking, self-correction, praising<br>Ask Ps to read the additions in detail<br>e.g. a) 2U + 7U = 9U, etc (in both directions)<br>Compare the estimated and calculated sums.<br>Feedback for T |
| **7** | ***PbY3b, page 89***<br>Q.2 Read: *Calculate the sums. Look at the diagram to see how the numbers change.*<br>Ps estimate in their heads, then do the calculations and check results against estimate, then by adding in opposite direction.<br>Review at BB with whole class. Mistakes corrected.<br>Discuss the diagram and elicit that:<br>• when the second term (number) is increased by 100, the sum also increases by 100.<br>• when the second term (number) is decreased by 100 (200), the sum also decreases by 100 (200).<br>*Solution*: a) b) c)<br>346 213 346 313 100 346 113 100<br>*38 min* | Individual work, monitored, helped<br>Diagram drawn on BB or use enlarged copy master or OHP<br>Deal with one part at a time<br>Discussion, reasoning, agreement, self-correction, praising |

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# Y3

*Lesson Plan 89*

| *Activity* | | *Notes* |
|---|---|---|
| **8** | ***PbY3b, page 89***<br>Q.3 Read: *Find the data and write a plan. Estimate, calculate and check the result. Write the answer as a sentence.*<br>Ps read problem and solve it by themselves.<br>Review at BB with whole class. P explains method of solution. Class agrees/disagrees or suggests alternative method. Mistakes corrected.<br>*A greengrocer ordered 264 kg of apples and 525 kg of bananas. How many kg of fruit did he order altogether?*<br>*Data: A: 264 kg, B: 525 kg*<br>*Plan*: A + B: 264 kg + 525 kg *E*: 260 + 530 = 790<br>*Answer:* He ordered 789 kg of fruit altogether. | Individual work, monitored, helped<br>Remind Ps to check sum by estimating and adding twice<br>Discussion, reasoning, checking, agreement, self-correcting, praising<br>BB: *C:* |
| **Extension** | T (with Ps' help) provides a context for another two problems, one involving addition and the other subtraction. Ps supply the values (3-digit numbers).<br>Work through each problem on BB with the whole class, as above. | Whole class activity<br>Involve several Ps<br>Praise all suggestions<br>Extra praise for clever contexts |

| | 2 | 6 | 4 |
|---|---|---|---|
| + | 5 | 2 | 5 |
| | 7 | 8 | 9 |

*45 min*

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| **Y3** | | *Lesson Plan* *90* |
|---|---|---|
| ***Activity*** | | ***Notes*** |
| | Practice, revision, activities, consolidation<br>***PbY3b, page 90*** | |

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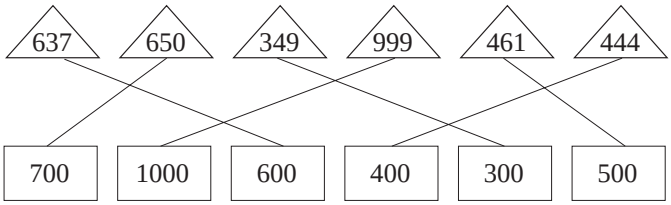
# Y3

R: Mental calculation

**C: Vertical addition, crossing tens. Problems in context.**

*E: Numbers up to 2000*

## *Lesson Plan* *91*

| *Activity* | | *Notes* |
|---|---|---|
| **1** | **Rounding to the nearest 100**<br>Join up the numbers to the matching values if rounded to the nearest 100. Ps come out to join up the numbers, explaining reasoning. Class agrees/disagrees. Elicit that 50 rounds up to next 100.<br>BB:<br>  <br><br>T points to a number. Class rounds it to the nearest 10. (640, 650, 350, 1000, 460, 440)<br>*5 min* | Whole class activity<br>Drawn on BB or use enlarged copy master or OHP<br>(or shapes cut out and stuck to BB and Ps rearrange them into 'houses')<br>At a good pace<br>Agreement, praising<br><br>In unison. Praising |
| **2** | **Addition 1**<br>**X**, tell me two 3-digit numbers. Let's add them up.<br>Class agrees on the estimated sum. Ps volunteer to do calculation.<br>• If there is no crossing tens:<br>e.g. 345 + 231<br>**X** comes to BB and does the addition, saying what he/she is doing.<br>'5 units + 1 unit = 6 units, so I write 6 in the units column in the answer.<br>4 tens + 3 tens = 7 tens, so I write 7 in the tens column in the answer.<br>3 hundreds + 2 hundreds = 5 hundreds, so I write 5 in the hundreds column in the answer.<br>The sum is 576.<br>Ps check it mentally. Who thinks **X** is correct? Who disagrees? etc.<br>• If there is crossing tens:<br>e.g. 364 + 476<br>Who can do this addition? **Y** comes out to BB to write and explain reasoning as above.<br>Allow mistakes to be made and ask rest of class to find them by comparing with the estimate. Ps suggest how to correct the mistake.<br>If Ps have a good idea about what to do, T confirms it:<br>Start at the units column.<br>4U + 6U = 10 U = 1T (added to tens column)<br>1T + 6T + 7T = 14 T = 1 H + 4 T<br>(1H is added to hundreds column,)<br>1H + 3H + 4H = 8H<br>Otherwise T says, 'Do not worry, we will learn it later in the lesson'.<br>Repeat for other pairs of numbers which do not involve crossing tens.<br>*12 min* | Whole class activity<br>T writes addition on BB (and Ps in *Ex. Bks*.)<br>Estimation can be done before or after the calculation.<br>*E*: 350 + 230 = 580<br><br>Encourage Ps to speak out loudly and clearly<br>(With T's help if necessary)<br><br>Check by comparison with estimate and reverse addition<br>Agreement, praising<br><br>Estimation can be done before or after the calculation.<br>*E*: 360 + 480 = 760 + 40 + 40<br>= 800 + 40<br>= 840<br><br>Discussion, reasoning, agreement, praising<br><br>Suggested by Ps |

| | | | |
|---|---|---|---|
| | 3 | 4 | 5 |
| + | 2 | 3 | 1 |
| | 5 | 7 | 6 |

| | | | |
|---|---|---|---|
| | 3 | 6 | 4 |
| + | 4 | 7 | 6 |
| | 7 | 13 | 10 |

↓

| | | | |
|---|---|---|---|
| | 3 | 6 | 4 |
| + | 4 | 7 | 6 |
| | 8 | 4 | 0 |

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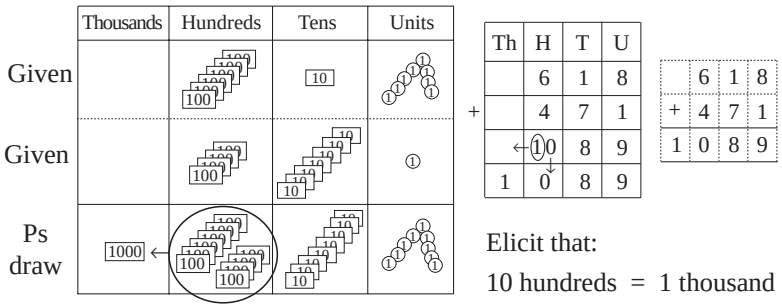
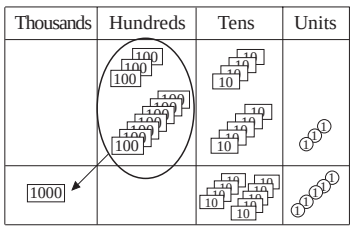
# Y3

*Lesson Plan 91*

| *Activity* | | *Notes* |
|---|---|---|
| **3** | **Addition 2**<br>Here is another sum. What numbers are being added? (618 + 471)<br>What should we do first? (Estimate the sum). Ps come out to write estimate by rounding the terms to the nearest 10. Class agrees/disagrees.<br>BB: 618 + 471 ≈ 620 + 470 = 600 + 400 + 20 + 70 = 1000 + 90 = 1090<br>  <br><br>Th H T U<br>6 1 8<br>+ 4 7 1<br>1 0 8 9<br>Elicit that:<br>10 hundreds = 1 thousand<br>Ps come to BB to complete the drawing and fill in the table and grid, explaining reasoning (with T's help). Class agrees/disagrees.<br>Is the answer is realistic? (Yes because 1089 ≈ 1090) What other check can we do? (Do the calculation in the opposite direction.)<br>Agree that 618 + 471 = 1089. Class reads equation in unison.<br>*17 min* | Whole class activity<br>Tables and grid drawn on BB or use enlarged copy master or OHP (or use model money)<br>Reasoning, agreement, praising<br>At a good pace<br>Ps suggest what should be done (with T's help).<br>Encourage Ps to say clearly what they are doing, e.g.<br>'8 units + 1 unit = 9 units, so I write 9 in the units column;<br>1 ten + 7 tens = 8 tens, so I write 8 in the tens column;<br>6 hundreds + 4 hundreds = 10 hundreds, but 10 hundreds = 1 thousand, so I write zero in the hundreds column and 1 in the thousands column.'<br>Ps write short form in *Ex. Bks* |
| **4** | ***PbY3b, page 91***<br>Q.1 Read: *Complete the drawing. Round the numbers to the nearest whole ten. Estimate, then calculate the sum.*<br>Let's see if you can do this addition by yourselves. (T can guide Ps through it if necessary and review after each step: drawing, estimation, place value table, short form in grid.)<br>If all done as individual work, review at BB with whole class. Ps dictate to T or come to BB (or T could have solution already prepared and uncover each part as it is dealt with).<br>Checks done. Mistakes discussed and corrected.<br>*Solution:*<br>342 + 753 *E:* 340 + 750 = 300 + 700 + 40 + 50 = 1000 + 90 = 1090<br>  <br><br>Th H T U<br>3 4 2<br>7 5 3<br>1 0 9 5<br>(10 hundreds = 1 thousand)<br>(If necessary, show interim step in diagram and place value table as in *Activity 3*.)<br>*22 min* | Individual trial, monitored, helped<br>(or whole class activity if T thinks Ps are still unsure)<br>Drawn on BB or use enlarged copy master or OHP<br>Discussion, reasoning, checking, agreement, self-correction, praising<br>Discuss why sum is more than estimate (both terms were rounded down)<br>T encourages Ps to read out additions in detail:<br>'2U + 3U = 5U, so I write 5 in the units column;<br>4T + 5T = 9T, so I write 9 in the tens column;<br>3H + 7H = 10H = 1Th + 0T, so I write 0 in the tens column and 1 in the thousands column.'<br>Feedback for T |

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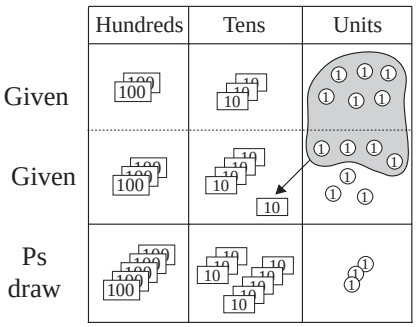
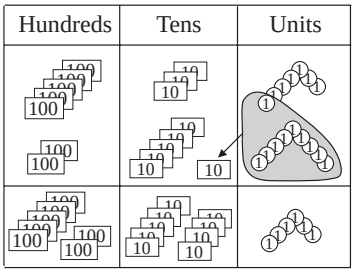
# Y3

*Lesson Plan 91*

| *Activity* | | *Notes* |
|---|---|---|
| **5** | **Addition 3**<br>What numbers are being added in this sum? (236 + 347)<br>What should we do first? (Estimate the sum). Ps come out to write estimate by rounding the terms to the nearest 10. Class agrees/disagrees.<br>BB: 236 + 347 ≈ 240 + 350 = 200 + 300 + 40 + 50 = 590<br>Ps come to BB to draw, explain and calculate (with T's help). Class agrees/disagrees. Discuss what to do about the 13 units and show in the diagram and place value table.<br>Discuss why the sum is less than the estimate (both terms were rounded up, so sum < 590) but agree that it is close, so is probably correct. Check further with addition in the opposite direction.<br>*Solution:*<br>  <br><br>H T U<br>2 3 6<br>+ 3 4 7<br>5 7 13<br>5 8 3<br>Elciti that:<br>13 units = 1 ten + 3 units<br>2 3 6<br>+ 3 4 7<br>5 8 3 | Whole class activity<br>Tables and grid drawn on BB or use enlarged copy master or OHP (or model money)<br>Reasoning, agreement, praising<br>Allow Ps to suggest what to do throughout and encourage other Ps to point out errors.<br>Encourage Ps to say clearly what they are doing, e.g.<br>"6U + 7U = 13 U, but 13 U = 1T + 3U, so I write 3 in the units column in the answer and add 1 to the tens column;<br>1T + 3T + 4T = 8T, so I write 8 in the tens column in the answer;<br>2H + 3H = 5H, so I write 5 in the hundreds column in the answer. The sum is 583.<br>Ps write short form in *Ex.Bks*. |
| | *26 min* | |
| **6** | ***PbY3b, page 91***<br>Q.2 Read: *Complete the drawing. Round the numbers to the nearest whole ten. Estimate, then calculate the sum.*<br>Let's see if you can do this addition by yourselves. (T can guide Ps through it if necessary and reviews after each step: drawing, estimation, place value table, short form in grid.)<br>If all done as individual work, review at BB with whole class. Ps dictate to T or come to BB (or T could have solution already prepared and uncover each part as it is dealt with).<br>Checks done. Mistakes discussed and corrected.<br>*Solution:*<br>537 + 259 ≈ 540 + 260 = 800<br>  <br><br>H T U<br>5 3 7<br>+ 2 5 9<br>7 8 16<br>7 9 6<br>5 3 7<br>+ 2 5 9<br>7 9 6 | Individual trial, monitored, helped<br>(or whole class activity if T thinks Ps are still unsure)<br>Drawn on BB or use enlarged copy master or OHP<br>Discussion, reasoning, checking, agreement, self-correction, praising<br>Ps read addition aloud in detail:<br>7U + 9U = 16U = 1T + 6U<br>1T + 3T + 5T = 9T<br>5H + 2H = 7H<br>The sum is 796.<br>Agree that 796 ≈ 800, so sum is probably correct<br>Feedback for T |
| | *31 min* | |

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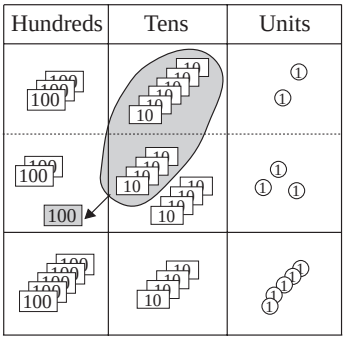
# Y3

*Lesson Plan 91*

| *Activity* | | *Notes* |
|---|---|---|
| **7** | **Addition 4**<br>Let's do one more to make sure that you understand. This time try to do it by yourselves!<br>What numbers are being added in this sum? (362 + 283)<br>Ps come out to write estimate. Class agrees/disagrees.<br>BB: 362 + 283 ≈ 360 + 280 = 300 + 200 + 60 + 80 = 500 + 140 = 640<br>Ps come to BB to draw, explain and calculate. Class agrees/disagrees. Ps decide what to do about the 14 tens and show in the diagram and place value table. Rest of class helps where necessary.<br>Elicit why the sum is more than the estimate (both terms were rounded down, so sum > 640) but agree that it is still close, so is probably correct.<br>*Solution:*<br>  <br><br>H T U<br>3 6 2<br>+ 2 8 3<br>5 ← 1 4 5<br>6 4 5<br>3 6 2<br>+ 2 8 3<br>6 4 5<br>14 T = 1H + 4T | Whole class activity<br>Tables and grid drawn on BB or use enlarged copy master or OHP (or model money)<br>Reasoning, agreement<br>T helps only if absolutely necessary.<br>Ps say clearly what they are doing, e.g.<br>'2U + 3U = 5 U, so I write 5 in the units column;<br>6T + 8T = 14T = 1H + 4T, so I write 4 in the tens column and add 1H to the hndreds column;<br>1H + 3H + 2H = 6H, so I write 6 in the hundreds column. The sum is 645'.<br>Ps write short form in *Ex.Bks*.<br>T tells Ps that they have been very clever! |
| | *36 min* | |
| **8** | ***PbY3b, page 91***<br>Q.3 Read: *Fiona has 367 books and her brother Graham has 715 books. How many books do they have altogether?*<br>Ps write the data, estimate the sum, fill in the tables, check the calculation and write the answer as a sentence.<br>Review at BB with whole class. Ps can show result on scrap paper or 'slates' on commnd. Ps who answered correctly explain to Ps who did not (wih T's help). Mistakes discussed and corrected.<br>*Solution:*<br>*Data:* F: 367 books, G: 715 books *E:* 370 + 720 = 1090<br>Th H T U<br>3 6 7<br>+ 7 1 5<br>← 1 0 7 ← 1 2<br>1 0 8 2<br>*Calculation:*<br>3 6 7<br>+ 7 1 5<br>1 0 8 2<br>*Answer:*<br>Fiona and Graham had 1082 books altogether.<br>(T shows interim line in table on BB but Ps need not do so in *Pbs.*)<br>N.B. Accept any correct calculation, even if done mentally. | Individual work, monitored, helped<br>If necessary, keep Ps together at each step.<br>Answers shown in unison<br>Discussion, reasoning, agreement, checking, self-correcting, praising<br>Eicit that sum < 1090, as both terms were rounded up.<br>Ps give details of calculation:<br>'7U + 5U = 12U = 1T + 2U, so write 2 in the units column and add 1T to the tens column;<br>1T + 6T + 1T = 8T, etc.<br>3H + 7H + = 10H = 1Th + 0H<br>etc. Ps read answer in unison. |
| | *42 min* | |
| **9** | ***PbY3b, page 91***<br>Q.4 Read: *Round these numbers to the nearest a) 10, b) 100.*<br>Review orally with whole class. Mistakes corrected.<br>If time, additional numbers for each part can be done orally. | Individual work, monitored<br>Agreement, self-correcting, praising<br>At speed round class. Praising. |
| | *45 min* | |

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# Y3

R: Mental calculation. Vertical addition
**C: Problems in context (addition)**
*E: Numbers up to 2000*

*Lesson Plan*
*92*

| *Activity* | | *Notes* |
|---|---|---|

**1**

**Sequences**

T says first 3 terms of a sequence. Ps continue it and then give the rule.

a) 867, 878, 889, (900, 911, 922, 933, 944, 955, . . .) *Rule:* +11

b) 432, 543, 654, (765, 876, 987, 1098, 1209, . . .) *Rule*: + 111

c) 333, 456, 579, (702, 825, 948, 1071, 1194, . . .) *Rule*: + 123

*10 min*

Whole class activity

T chooses Ps at random

At difficult steps, T suggests that Ps do calculations in *Ex. Bks.* using vertical addition.

Praising, encouragement only

**2**

**Analysis of addition**

Let's do these additions. Ps come to BB to do calculations, explaining reasoning. Study the additions and the diagram. What do you notice?

BB:

a)

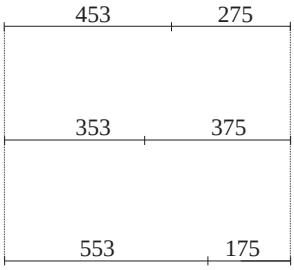
| | | | |
|---|---|---|---|
| | 4 | 5 | 3 |
| + | 2 | 7 | 5 |
| | 7 | 2 | 8 |

b)

| | | | |
|---|---|---|---|
| | 3 | 5 | 3 |
| + | 3 | 7 | 5 |
| | 7 | 2 | 8 |

c)

| | | | |
|---|---|---|---|
| | 5 | 5 | 3 |
| + | 1 | 7 | 5 |
| | 7 | 2 | 8 |




Elicit that, e.g.:

a) → b): The first number decreased by 100, but the 2nd number increased by 100, so the sums are the same.

b) → c): The first number increased by 200 but the 2nd number decreased by 200, so the sums are the same. etc.

*15 min*

Whole class activity

Drawn on BB or use enlarged copy master or OHP

Reasoning, agreement, praising

Ps can copy into *Ex. Bks* too

Discussion, agreement, praising

Feedback for T

**3**

**Problem 1**

Listen carefully and think how you would solve the problem.

*Ally, Betty and Cindy Squirrel collected acorns for their winter store. Ally collected 325 acorns, Betty collected 231 acorns and Cindy collected 516 acorns. How many acorns did they collect altogether?*

What should we do first? Who agrees? What should we do next? etc.

Ps come to BB to write data, plan, estimate, calculation in place value table and in short form in grid. Check by comparing with the estimate and by calculating in opposite direction.

BB: e.g.

*Data*: A: 325, B: 231, C: 516 *Plan*: A + B + C = 325 + 231 + 516

*E*: 330 + 230 + 520 = 300 + 200 + 500 + 30 + 30 + 20 = 1000 + 80
= 1080

| | Th | H | T | U |
|---|---|---|---|---|
| | | 3 | 2 | 5 |
| | | 2 | 3 | 1 |
| + | | 5 | 1 | 6 |
| | ← | 10 | 6 ← | 12 |
| | 1 | 0 | 7 | 2 |

| | | | | |
|---|---|---|---|---|
| | | 3 | 2 | 5 |
| | | 2 | 3 | 1 |
| + | | 5 | 1 | 6 |
| | 1 | 0 | 7 | 2 |

Ps say details of calculation:

5U +1U +6U = 12U = 1T + <u>2U</u>

1T + 2T + 3T + 1T = <u>7T</u>

3H + 2H + 5H = 10H = <u>1Th</u> + <u>0H</u>

*Answer*: They collected 1072 acorns altogether.

*20 min*

Whole class activity

T repeats slowly and Ps make a note of the data.

Discussion, reasoning, agreement, checking, praising

Calculate ↓ and check ↑ or vice versa

Agree that 1072 ≈ 1080

Ps write short form in *Ex. Bks*

T points out that it would have been easier to estimate by rounding to the nearest 100:

*E*: 300 + 200 + 500 = 1000

but that rounding to the nearest 10 is closer.

Ps say answer in unison.

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# Y3

*Lesson Plan 92*

| *Activity* | | *Notes* |
|---|---|---|
| **4** | **Missing digits**<br>What digits do you think are missing from this addition?<br>Ps come out to fill in the digits, explaining reasoning. Class agrees/ disagrees. Let's check it (by doing calculation again).<br>Who can make other additions from these digits which also have sum 567? T writes what Ps dictate. Ps explain their reasoning. Class checks it by mentally calculating in opposite direction.<br>BB: e.g. $\begin{array}{r} 429 \\ +\,138 \\ \hline 567 \end{array}$ $\begin{array}{r} 428 \\ +\,139 \\ \hline 567 \end{array}$ $\begin{array}{r} 219 \\ +\,348 \\ \hline 567 \end{array}$ etc.<br>*25 min* | Whole class activity<br>BB: $\begin{array}{r} 1\,\boxed{2}\,9 \\ +\,\boxed{4}\,3\,8 \\ \hline \boxed{5}\,6\,\boxed{7} \end{array}$<br>Agreement, praising<br>(or individual work in *Ex. Bks* if Ps wish)<br>Feedback for T |
| **5** | ***PbY3b, page 92***<br>Q.1 Read: *Estimate, then calculate the sums. Write the estimates in detail.*<br>Deal with one part at a time. Review at BB with whole class. Mistakes discussed and corrected.<br>*Solution:*<br>a) $513 + 521 \approx 510 + 520 = 1030 <$ $\begin{array}{r} {\scriptstyle 1}\,513 \\ +\,521 \\ \hline 1034 \end{array}$<br>b) $634 + 723 \approx 630 + 720 = 1350 <$ $\begin{array}{r} {\scriptstyle 1}\,634 \\ +\,723 \\ \hline 1357 \end{array}$<br>c) $358 + 411 \approx 360 + 410 = 770$ $\begin{array}{r} 358 \\ +\,411 \\ \hline 769 \end{array}$<br>d) $476 + 218 \approx 480 + 220 = 700 >$ $\begin{array}{r} 47{\scriptstyle 1}6 \\ +\,218 \\ \hline 694 \end{array}$<br>e) $563 + 295 \approx 560 + 300 = 860$ $\begin{array}{r} {\scriptstyle 1}\,563 \\ +\,295 \\ \hline 858 \end{array}$<br>Which addition is different from the others? (Part c) does not involve crossing tens.)<br>*31 min* | Individual work, monitored, helped<br>T suggests to Ps who have difficulty keeping the number being carried over in their head to write the number (in a smaller size) above or below the column.<br>T reminds Ps about checking sums by comparing with estimates.<br>Discussion, reasoning, checking, agreement, self-correcting, praising<br>Encourage Ps to say the calculations in detail.<br>Who had all 5 sums correct?<br>Class applauds excellent work<br>Stars/stickers etc. awarded |
| **6** | **Problem 2**<br>Listen carefully, write the data in your *Ex. Bks*, do the calculation, check it and show me the answer when I say.<br>*I am making a birthday cake from these ingredients.*<br>*250 g of sugar, 190 g of butter, 300 g of flour, 100 g of raisins, 50 g of shelled walnuts, 50 g of chocolate, 100 g of cherries, 2 eggs. What will the total weight of the cake be if each egg weighs 60 g?*<br>Show me the answer . . . now! (1160 g)<br>Ps with correct response explain to the rest of the class. Who agrees? Who did it a different way? etc. Mistakes discussed and corrected.<br>*Data*: S: 250 g, B: 190 g, F: 300 g, R: 100 g, W: 50 g, Cho: 50 g, Che: 100 g, 2 E: $2 \times 60$ g $= 120$ g<br>*Plan*: (250 + 190 + 300 + 100 + 50 + 50 + 100 + 120) g<br>*Answer*: The total weight of the cake will be 1160 g. (= 1 kg 160 g)<br>*36 min* | Individual (or paired) work, monitored, helped<br>T repeats slowly once of twice while Ps make a note of data.<br>Give Ps time to do calculation<br>In unison (on paper or slates)<br>Reasoning, checking, agreement, self-correction, praising<br>*Calculation*: vertical, horizontal or mental (adding hundreds first, then tens)<br>T can check with a calculator. |

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# Y3

*Lesson Plan 92*

| *Activity* | | *Notes* |
|---|---|---|
| **7** | ***PbY3b, page 92***<br>Q.2 Read: *Mum wants to make matching dresses for herself and her daughter, Julia. She needs 2 m 35 cm for her own dress and 1 m 25 cm for Julia's dress.*<br>*How much material will she need to buy altogether?*<br>Ps write the data, make a plan, estimate the sum, do the calculation, check it and write the answer as a sentence.<br>Review at BB with whole class. Ps can show result on scrap paper or 'slates' on command. Ps who answered correctly explain to Ps who did not (wih T's help). Mistakes discussed and corrected.<br>*Solution:*<br>*Data:* M: 2 m 35 cm = 235 cm, J: 1 m 25 cm = 125 cm<br>*Plan*: M + J: 235 cm + 125 cm<br>*Estimate*: 235 cm + 125 cm ≈ 240 cm + 130 cm = 370 cm<br>*Calculation*: $\begin{array}{r} {}^{1}2\,3\,5 \\ +\,1\,2\,5 \\ \hline 3\,6\,0 \end{array}$ ↓↑ *Check*: 360 ≈ 370<br>or 2 m 35 cm + 1 m 25 cm<br>= 2 m + 1 m + 35 cm + 25 cm<br>= 3 m + 60 cm = 3 m 60 cm<br>*Answer*: Mum will need to buy 360 cm (= 3 m 60 cm) of material. | Individual work, monitored, helped<br>Ps may use *Ex. Bks* if there is not enough room in *Pbs*.<br>Ps do calculation in whichever way they wish, using which-ever unit they prefer.<br>Results shown in unison<br>Reasoning, checking, agreement, self-correction, praising<br>T shows vertical addition in place value table, giving details of the additions<br>BB: |
| | *40 min* | |
| **8** | ***PbY3b, page 92***<br>Q.3 Ps read problems themselves and solve them. Set a time limit. Review at BB with whole class. Ps explain method of solution and discuss and correct mistakes.<br>a) *Kate used a 23 cm 5 mm piece of ribbon to tie up her hair. Linda used a piece 12 cm 5 mm less than Kate's. What length was Linda's ribbon?*<br>*Solution:*<br>*Data:* K: 23 cm 5 mm = 235 mm, L: K – 125 mm<br>*Plan*: 235 mm – 125 mm<br>*Estimate*: 235 mm – 125 mm ≈ 240 mm – 130 mm = 110 mm<br>*Check*: Calculated difference = estimate<br>*Answer*: The length of Linda's ribbon was 110 mm. (= 11 cm)<br>b) *Dad bought a piece of wood and cut it into two pieces, one 2 m 35 cm and the other 3 m15 cm long. What length of wood did Dad buy?*<br>*Data:* 2 m 35 cm = 235 cm, 3 m 15 cm = 315 cm<br>*Plan*: 235 cm + 315 cm<br>*Estimate*: 235 cm + 315 cm ≈ 240 cm + 320 cm = 560 cm<br>*Check*: 550 cm ≈ 560 cm (less because both rounded up)<br>*Answer*: The length of wood Dad bought was 560 cm (= 5 m 50 cm) | Individual work, monitored, helped<br>Differentiation by time limit<br>Reasoning, checking, agreement, self-correction, praising<br>*Calculation*: $\begin{array}{r} 2\,3\,5 \\ -\,1\,2\,5 \\ \hline 1\,1\,0 \end{array}$<br>or 23 cm 5 mm – 12 cm 5 mm<br>= 11 cm 0 mm = 11 cm<br>*Calculation*: $\begin{array}{r} {}^{1}2\,3\,5 \\ +\,3\,1\,5 \\ \hline 5\,5\,0 \end{array}$<br>or 2 m 35 cm + 3 m 15 cm<br>= 2 m + 3 m + 35 cm + 15 cm<br>= 5 m + 50 cm = 5 m 50 cm |
| | *45 min* | |

BB:

| | H | T | U |
|---|---|---|---|
| | 2 | 3 | 5 |
| + | 1 | 2 | 5 |
| | 3 | 5 | ①0 |
| | 3 | 6 | 0 |

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# Y3

R: Mental calculation
**C: Addition**
*E: Numbers up to 2000*

## *Lesson Plan* *93*

| *Activity* | | *Notes* |
|---|---|---|
| **1** | **Rounding practice**<br>Study this table and think what the rule is. Ps come out to choose a column and fill in missing numbers. Class agrees/disagrees.<br>BB: | Whole class activity<br>Table drawn on BB or use enlarged copy master or OHP<br>**Bold** numbers are given<br>At a good pace<br>Reasoning, agreement, praising<br>Feedback for T |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **A** | **618** | **344** | **192** | **396** | **155** | **743** | **608** | **222** | **555** | **999** | **1206** |
| **B** | **600** | **300** | 200 | 400 | 200 | 700 | 600 | 200 | 600 | 1000 | 1200 |
| **C** | **620** | **340** | 190 | 400 | 160 | 740 | 610 | 220 | 560 | 1000 | 1210 |

Elicit that: B is A rounded to the nearest 100
C is A rounded to the nearest 10
(B is also C rounded to the nearest 100)

*5 min*

| | | |
|---|---|---|
| **2** | **Sequences**<br>T says first few terms of a sequence. Ps continue it and then give the rule.<br>a) 920, 870, 820, (770, 720, 670, 620, 570, 520, . . .) *Rule:* – 50<br>b) 327, 368, 409, (450, 491, 532, 573, 614, 655, . . .) *Rule*: + 41<br>c) 2, 3, 5, 8, 12, 17, (23, 30, 38, 47, 57, 68, 80, 93, 107, . . .)<br>(1 2 3 4 5 6 7 8 9 10 11 12 13 14 . . .)<br>*Rule*: The difference is increasing by 1. | Whole class activity<br>a) and b) done orally round class. If a P makes a mistake, the next P corrects it.<br>c) Ps come to BB to write each term (or dictate to T)<br>Discussion on the rule.<br>Agreement, praising |

*10 min*

| | | |
|---|---|---|
| **3** | **Addition practice**<br>Let's estimate these sums by rounding the terms to the nearest 10, then do the calculation. Ps check by comparing with estimate and by doing the calculation in reverse order. Show in place value table if necessary.<br>BB:<br>a) 328 + 17 + 114 (≈ 330 + 20 + 110 = 460)<br>b) 1326 + 9 + 35 (≈ 1330 + 10 + 40 = 1380)<br>c) 34 + 128 + 1416 (≈ 30 + 130 + 1420 = 1580) | Whole class activity<br>T chooses Ps to work at BB and rest of class work in *Ex. Bks* (or on squared paper)<br>Reasoning, agreement, checking, praising<br>Ps explain additions in detail:<br>a) '8U + 7U + 4U = 19U = 1T + 9U', so I write 9 in the units column and add 1T to the tens column', etc.<br>Stress the importance of writing the digits in the correct column.<br>T can check with a calculator. |

$$\begin{array}{r} {\scriptstyle 1}\\ 328\\ 17\\ +\,114\\ \hline 459 \end{array} \qquad \begin{array}{r} {\scriptstyle 2}\\ 1326\\ 9\\ +\;\;35\\ \hline 1370 \end{array} \qquad \begin{array}{r} {\scriptstyle 1}\\ 34\\ 128\\ +1416\\ \hline 1578 \end{array}$$

*15 min*

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# Y3

*Lesson Plan 93*

| *Activity* | | *Notes* |
|---|---|---|
| **4** | **Problem**<br>Listen carefully, write the data in your *Ex. Bks.* and think how you would solve it. Draw a rough picture of each toy if you want to.<br>*Molly wants to buy some toys. Shc can choose from a teddy bear at £6 41 p, a game at £7 16 p, a doll at £6 24 p, a ball at £3 28 p and a boat at £4 56 p.*<br>*If she bought any 2 of them, she would have some money left, but not enough to buy 3 of the toys. How much money could Molly have?*<br>T asks several Ps what they think and class agrees on a method of solution. T writes what Ps dictate on BB and Ps write in *Ex. Bks.*<br>*Solution*: e.g.<br>1) Molly has more money than the total cost of the 2 most expensive toys.<br>BB: M > £7 16 p + £6 41 p<br>M > £13 57 p<br>$\begin{array}{r} {\scriptstyle 1}\,716 \\ +\ 641 \\ \hline 1357 \end{array}$<br>2) Molly has less money than the total cost of the 3 cheapest toys.<br>BB: M < £3 28 p + £4 56 p + £6 24 p<br>M > £14 08 p<br>$\begin{array}{r} {\scriptstyle 1\ 1\ 1}\ 328 \\ 456 \\ +\ 624 \\ \hline 1408 \end{array}$<br>So Molly has more than £13 57 p, but less than £14 08 p.<br>Who can write it mathematically? Who can write it in £s only? | Whole class activity<br>T could have drawings or pictures cut out of magazines stuck to BB with price labels beneath each one.<br>T repeats slowly<br>Give Ps time to think and discuss with their neighbours.<br>Reasoning, agreement, checking, praising<br>(or £7 + £6 + 16 p + 41 p)<br>(or £3 + £4 + £6 + 28 p + 56 p + 24 p = £13 + 108 p = £14 08 p)<br>BB:<br>£13 57 p < M < £14 08 p<br>£13.57 < M < £14.08 |
| | *20 min* | |
| **5**<br>**Extension** | **Analysing mistakes**<br>*Harry Harum-Scarum* has done his homework. Let's see if he has done it well. Ps come to BB to estimate the sums first and tick or cross out the answers, explaining reasoning. Class agrees/disagrees.<br>Lets see if you can do the additions correctly in your *Ex. Bks.* Review quickly at BB with whole class. Mistakes corrected.<br>BB:<br>a) $\begin{array}{r} 385 \\ +\ 241 \\ \hline \cancel{716} \end{array}$ ≈ 630 (626)<br>b) $\begin{array}{r} 27 \\ +\ 46 \\ \hline \cancel{613} \end{array}$ ≈ 80 (73)<br>c) $\begin{array}{r} 946 \\ +\ 138 \\ \hline \cancel{184} \end{array}$ ≈ 1090 (1084)<br>d) $\begin{array}{r} 563 \\ +\ 845 \\ \hline \cancel{148} \end{array}$ ≈ 1410 (1408)<br>e) $\begin{array}{r} 56 \\ +\ 84 \\ \hline \cancel{1310} \end{array}$ ≈ 140 (140) | Whole class activity in analysing mistakes<br>T has BB or SB or OHT already prepared<br>Reasoning, agreement, praising<br>Individual work in finding correct answers, monitored<br>Agreement, self-correction, praising |
| | *25 min* | |
| **6** | ***PbY3b, page 93***<br>Q.1 Read: *Round the numbers to the nearest ten, then estimate and calculate the sums.*<br>Review at BB with whole class. Mistakes corrected.<br>*Solution*:<br>a) 428 + 541<br>*E:* 970<br>$\begin{array}{r} 428 \\ +\ 541 \\ \hline 969 \end{array}$<br>b) 1328 + 661<br>*E:* 1990<br>$\begin{array}{r} 1328 \\ +\ 661 \\ \hline 1989 \end{array}$<br>c) 462 + 1417<br>*E:* 1880<br>$\begin{array}{r} 462 \\ +\ 1417 \\ \hline 1879 \end{array}$ | Individual work monitored, (helped)<br>Written on BB or use enlarged copy master or OHP<br>Reasoning, agreement, checking, self-correction, praising<br>Feedback for T |
| | *29 min* | |

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# Y3

*Lesson Plan 93*

| *Activity* | | *Notes* |
|---|---|---|
| **7** | ***PbY3b, page 93***<br>Q.2 Read: *Round the numbers to the nearest ten, then estimate and calculate the sums.*<br>Let's see how many of these you can do in 3 minutes!<br>Ps finished early can can exchange *Pbs* with their neighbours to check each other's work.<br>Review at BB with whole class. Mistakes discussed and corrected.<br>*Solution*:<br>a) *E:* 1760 → 1436 + 322 = 1758; *E:* 1450 → 1362 + 92 = 1454; *E:* 930 → 572 + 356 = 928; *E:* 960 → 638 + 322 = 960<br>b) *E:* 1170 → 856 + 312 = 1168; *E:* 1270 → 358 + 911 = 1269; *E:* 950 → 862 + 92 = 954; *E:* 920 → 507 + 408 = 915<br>*34 min* | Individual work monitored, (helped)<br>Written on BB or use enlarged copy master or OHP<br>Ps may do rounding in *Ex. Bks* (or round to nearest 100 if T prefers)<br>Differentiation by time limit<br>Reasoning, agreement, checking, self-correction, praising<br>T notes Ps having difficulty with crossing tens |
| **8** | ***PbY3b, page 93***<br>Q.3 Read: *Uncle Tom gathered 468 kg of pears and 1335 kg of apples from the trees in his orchard. How much fruit did he gather altogether?*<br>Deal with one step at a time. Review after each step. Ps can round to nearest 100. Mistakes discussed/corrected.<br>*Solution*:<br>*Data*: P: 468 kg, A: 1335 kg<br>*Plan*: P + A: 468 kg + 1335 kg *E*: 500 + 1300 = 1800<br>*Answer*: He gathered 1803 kg of fruit altogether.<br>*38 min* | Individual work, monitored, but class kept together throughout<br>Ps suggest order of steps<br>Discussion, reasoning, checking, agreement, self-correction, praising<br>*C*: 468 + 1335 = 1803 |
| **9** | ***PbY3b, page 93***<br>Q.4 Read: *Paul has a piece of wire 5 m 47 cm long but it is 602 cm shorter than he needs. What length of wire does Paul need?*<br>Discuss which unit of length it would be easiest to use (cm). Elicit that: 1 m = 100 cm (BB)<br>Deal with one step at a time. Review after each step. Ps can round to nearest 10. Mistakes discussed/corrected.<br>*Solution*:<br>*Data*: Has: 5 m 47 cm = 547 cm, Needs: 602 cm more<br>*Plan*: 547 cm + 602 cm *E*: 550 + 600 = 1150<br>*Answer*: Paul needs 1149 cm (= 11 m 49 cm) of wire.<br>*42 min* | Individual work, monitored, but class kept together throughout (unless Ps wish to try it on their own)<br>Ps suggest order of steps<br>Discussion, reasoning, checking, agreement, self-correction, praising<br>*C*: 547 + 602 = 1149 |

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| **Y3** | | *Lesson Plan 93* |
|---|---|---|
| ***Activity*** | | ***Notes*** |
| **10** | ***PbY3b, page 93***<br>Q.5 Read: *Mark Barry Bear's sums with a tick or a cross. Correct his mistakes.*<br>You have 2 minutes to check *Barry Bear*'s sums!<br>Review quickly with whole class. Deal with one part at a time.<br>Stand up if you marked part a) correct and hold your nose if you marked it wrong. Show me . . . now! Repeat for each part.<br>P who responded incorrectly goes through sum on BB with help of class. Mistakes corrected.<br>*Solution*:<br>a) 221 + 387 = ~~5~~08 × (608)<br>b) 532 + 209 = 741 ✔<br>c) 459 + 111 = 570 ✔<br>d) 833 + 74 = ~~8~~07 × (907)<br>e) 567 + 603 = 11~~8~~0 × (1170) | Individual work, monitored<br>Written on BB or use enlarged copy master or OH<br>Differentiation by time limit<br>In unison<br>At a good pace<br>Reasoning, agreement, self-correction, praising |
| | *45 min* | |

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# Y3

R: Mental calculation
**C: Addition. Missing digits.**
*E: Puzzles*

## *Lesson Plan* *94*

| *Activity* | | *Notes* |
|---|---|---|
| **1** | **Puzzle**<br>Let's write the digits from 1 to 6 in the boxes so that the sum is:<br>BB: □□□ + □□□ ———— ————<br>a) the smallest possible<br>b) the greatest possible<br>c) even d) odd<br>e) at least 800 f) at most 800<br>g) divisible by 5 h) divisible by 10<br>i) between 600 and 700 j) between 750 and 800.<br>Ps come to BB to show their additions. Who has thought of another one? etc. Class agrees/disagrees.<br>*Solution*:<br>a) 135 + 246 = 381 b) 642 + 531 = 1173 c) e.g. 154 + 632 = 786 d) e.g. 451 + 236 = 687 e) e.g. 561 + 243 = 804<br>f) e.g. 154 + 632 = 786 g) e.g. 654 + 231 = 885 h) e.g. 234 + 516 = 750 i) e.g. 451 + 236 = 687 j) e.g. 154 + 632 = 786<br>*8 min* | Whole class activity<br>Grids drawn on BB (or use enlarged copy master or OHP)<br>Ps can try each one in *Ex. Bks* first (or each P has a copy of the copy master sheet)<br>Elicit strategies for solution. e.g.<br>• for smallest sum, the two biggest digits should be in the units column;<br>• for largest sum the two biggest digits should be in the hundreds column;<br>• divisible by 5 means that 5 should be in the units column, etc.<br>Ps might notice that some additions can be used in more than one part. |
| **2** | **Missing numbers**<br>How much money do Anne* and Brigit* have? Let's fill in the table.<br>Ps come out to fill in the missing numbers, explaining reasoning and showing calculations at side of BB. Class agrees/disagrees.<br>BB:<br>A (£): **134** **258** **647** **376** **247** **1326** 178 579<br>B (£): **312** **427** **836** 522 815 484 **736** **542**<br>A + B (£): 446 685 1483 **898** **1062** **1810** **914** **1121**<br>The last three columns are the most difficult and might need to be shown in a place value table. Write problem calculations on BB.<br>*15 min* | Whole class activity<br>Table drawn on BB or use enlarged copy master or OHP<br>* Use names of Ps in class<br>**Bold** numbers are given<br>Ps may do calculations in *Ex. Bks*.<br>Reasoning, agreement, checking, praising<br>Ps give details of difficult additions. |
| **3** | ***PbY3b, page 94***<br>Q.1 Read: F*ill in the missing digits. Check the addition.*<br>Deal with one part at a time. Review at BB with whole class. Ps come to BB to fill in their numbers, explaining reasoning. Class agrees/disagrees. Mistakes corrected.<br>*Solution:*<br>a) 324 + **252** = 576 b) **249** + 421 = 670 c) 352 + **224** = 576 d) 327 + **757** = 1084<br>*20 min* | Individual work, monitored, (helped)<br>Drawn on BB or use enlarged copy master or OHP<br>Reasoning, checking, agreement, self-correction, praising<br>**Bold** numbers are missing.<br>Feedback for T |

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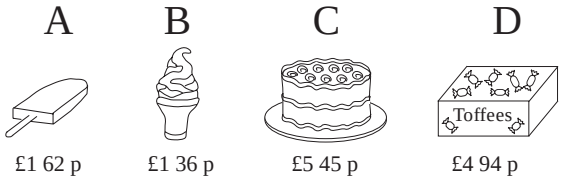
# Y3

*Lesson Plan 94*

| *Activity* | | *Notes* |
|---|---|---|
| **4** | **Written exercises**<br>Add up these numbers using vertical addition. T dicates numbers and Ps write in columns in *Ex. Bks*, then add them up. Ps check answers by adding columns in opposite direction.<br>Deal with one part at a time. Review at BB or OHP with whole class. T could have BB or SB or OHT already prepared and uncover each answer as it is dealt with. Mistakes discussed and corrected. | Individual work, monitored, helped<br>Ps use squared grid in *Ex. Bks*.<br>Agreement, checking, self-correction, praising |
| | a) 321, 32, 3<br>321 + 32 + 3 = 356<br>b) 127, 6, 53<br>127 + 6 + 53 = 186<br>c) 265, 43, 1<br>265 + 43 + 1 = 309<br>d) 362, 13, 512<br>362 + 13 + 512 = 887 | Written beforehand on BB or SB or OHP<br>Stress the importance of writing the digits in the correct column.<br>(Ps can write Th, H, T, U above their columns if they need to.) |
| | e) 412, 5, 331, 41<br>412 + 5 + 331 + 41 = 789<br>f) 8, 325, 39, 430<br>8 + 325 + 39 + 430 = 802<br>g) 25, 671, 60, 251<br>25 + 671 + 60 + 251 = 1007<br>f) 853, 4, 211, 20<br>853 + 4 + 211 + 20 = 1088 | T asks Ps how many they had correct out of 8.<br>Class applauds excellent work<br>Feedback for T |
| | *28 min* | |
| **5** | ***PbY3b, page 94, Q.2***<br>Read: *In how many different ways can Jenny choose from these treats?*<br>Talk about the pictures first. Let's label them A, B, C and D so that we do not have to write their names each time. (Ps label in *Pbs* too.)<br>BB:<br>  <br><br>£1 62 p £1 36 p £5 45 p £4 94 p | Whole class activity<br>Pictures drawn on BB or use enlarged copy master or OHP (or cut out of magazines and stuck to BB)<br>Stress that in maths, we try to use short ways to express things whenever we can. |
| | T asks several Ps what they would choose if they could buy only 1 thing (2 things). Why? | Discussion. Ps give reasons for their choice. |
| | a) Read: *Write how much she would pay if she bought at most two things.*<br>Elicit that Jenny could buy either (1) thing or (2) things and relate to letters, numbers and missing amounts in *Pbs*.<br>Ps come to BB to fill in the amounts, explaining reasoning. Details of calculations can be done at the side of the BB (or Ps can work in *Ex. Bks*.). Class points out errors.<br>BB:<br>(1) A: £ 1 62 p or B: £1 36 p or C: £5.45 p or D: £4 94 p<br>(2) A + B: £2 98 p, or A + C = £7 07 p, or A + D = £6 56 p, B + C = £6 81 p, or B + D = £6 30 p, or C + D = £10 39 p<br>(Details of additions can be written horizontally or vertically.) | Discussion, reasoning, checking, agreement, praising<br>Rest of Ps write in *Pbs* too.<br>Agree that there are 4 cases<br>Ps suggest the missing cases.<br>Agree that there are<br>$1 \times 3 \times 2 = 6$ cases |

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# Y3

*Lesson Plan 94*

| ***Activity*** | | ***Notes*** |
|---|---|---|
| | b) Read: *Write how much she would pay if she bought at least 3 things.*<br>Elicit that Jenny could buy either (3) things or (4) things and relate to letters, numbers and missing amounts in *Pbs*.<br>Ps come to BB to fill in the amounts, explaining reasoning. Details of calculations can be done at the side of the BB (or Ps can work in *Ex. Bks*.). Class points out errors.<br>BB:<br>(3) A + B + C = £8 43 p, or A + B + D = £7 92 p, or A + C + D = £12 01 p, or B + C + D = £11 75 p (4 cases)<br>(4) A + B + B + C + D = £13 37 p (1 case) | Discussion, reasoning, checking, agreement, praising<br>Rest of Ps work in *Pbs*.<br>Ps suggest missing cases.<br>(Experience of combinations) |
| **Extension** | Who can write the prices in £s only? (£1.62, £1.36, £5.45, £4.94) | P come to BB or dictate to T<br>Agreement, praising |
| | *38 min* | |
| **6** | ***PbY3b, page 94***<br>Q.3 Do part a) then exercise your brains on part b)!<br>T explains each part first.<br>a) Read: *Fill in the missing digits.*<br>Make sure that Ps realise that they should write digits only in the grid squares which have 'dashes' and that they should check by doing the additions again in their heads.<br>Review quickly at BB with whole class. Mistakes corrected.<br>*Solution:*<br>a) i) 325 + 1243 = 1568; ii) 135 + 913 = 1048; iii) 539 + 801 = 1340; iv) e.g. 507 + 1188 = 1695; v) e.g. 975 + 361 = 1336<br>b) Read: *Write an addition which uses each of the digits from 0 to 9 once only. Try out different solutions. Use your exercise books if you need to.*<br>Make sure that Ps realise that each addition has 10 boxes (including the answer) and that there are 10 digits from 0 to 9.<br>As soon as a P solves it, he/she shows solution to class. Class decides whether or not solution is valid.<br>*Possible solutions:* 289 + 764 = 1053 or 269 + 784 = 1053 etc. | a) Individual work, monitored helped<br>Written on BB or use enlarged copy master/OHP<br>Discussion, reasoning, checking, agreement, self-correction, praising<br>Parts iv) and v) have several solutions – accept any correct answer.<br>Feedback for T<br>b) Individual or paired work, monitored<br>This is a very challenging problem!<br>Ps can manipulate number cards on desks, or use *Ex. Bks* to practice in and only write concrete solutions in *Pbs*.<br>Extra praise if a P solves it during the lesson.<br>Otherwise Ps can try to solve it at home if they wish. |
| | *45 min* | |

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| **Y3** | | *Lesson Plan* *95* |
|---|---|---|
| ***Activity*** | | ***Notes*** |
| | Tables practice, revision, activities, consolidation<br>*PbY3b, page 95* | |

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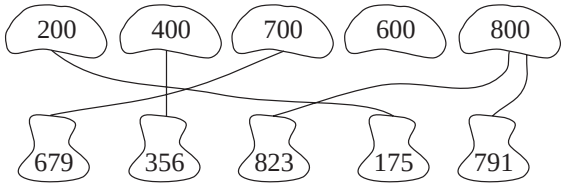
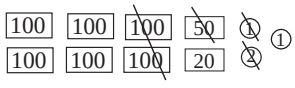
# Y3

R: Addition, subtraction. Multiplication and division by 2, 5, 10

**C: Multiplication and division table for 3**

*E: Product of more than two factors*

## *Lesson Plan* *96*

| *Activity* | | *Notes* |
|---|---|---|
| **1** | **Rounding to the nearest 100**<br>Join up the numbers to the matching values if rounded to the nearest 100. Ps come out to join up the numbers, explaining reasoning. Class agrees/disagrees. Elicit that 50 rounds up to next 100.<br>BB:<br>  <br><br>Which mushroom head does not have a matching stalk? (600)<br>Which mushroom head belongs to more than one stalk? (800)<br>T points to a number and Ps round it to the nearest 10.<br>*4 min* | Whole class activity<br>Drawn on BB or use enlarged copy master or OHP<br>(or shapes cut out and stuck to BB and Ps rearrange them into 'mushrooms')<br>At a good pace<br>Agreement, praising<br>Ps think of values for a stalk<br>Which is closer to 800? (791)<br>At speed round class |
| **2** | **Subtraction 1**<br>What is the difference if I subtract from 950:<br>a) 150 ( 950 – 150 = 800) b) 250 (950 – 250 = 700)<br>c) 350 (950 – 350 = 600) d) 650 (950 – 650 = 300)<br>e) 50? (950 – 50 = 900)<br>What do you notice about how the differences change? Elicit that:<br>• If I subtract 100 more from the same amount, then the difference will be 100 less.<br>• If I subtract 100 less from the same amount, then the difference will be 100 more.<br>*9 min* | Whole class activity<br>Ps come to BB to write subtractions (or dictate to T)<br>Class points out errors<br>Discussion, agreement, praising |
| **3** | **Subtraction 2**<br>What is the difference if I subtract 450 from:<br>a) 850 ( 850 – 450 = 400) b) 950 (950 – 450 = 500)<br>c) 750 (750 – 450 = 300) d) 650 (650 – 450 = 200)<br>e) 500? (500 – 450 = 50)<br>What do you notice about how the differences change? Elicit that:<br>• If I subtract the same amount from a number which is 100 more, then the difference will be 100 more.<br>• If I subtract the same amount from a number which is 100 less, then the difference will be 100 less.<br>*12 min* | Whole class activity<br>Ps come to BB to write subtractions (or dictate to T)<br>Class points out errors<br>Discussion, agreement, praising |
| **4** | **Problem**<br>Listen carefully and think how you would work out the answer.<br>*Two brothers had £674 in their bank accounts altogether. They bought a television set for £253. How much money did they have left ?*<br>Ps tell T what to do and dictate what to write on BB. Ps copy in *Ex. Bks*.<br>BB: *Data*: Had: £674, Spent: £253, *Plan*: Have left: £674 – £253<br>*E*: £670 – £250 = £420 *C*: £674 – £253 = £421<br>*Answer*: They had £421 left.<br>*17 min* | Whole class activity<br>(T could have a picture of a TV and price stuck to BB)<br>Discuss rounding:<br>to nearest 100 is easier but to nearest 10 is closer.<br>Show money model on BB:<br>  <br> |

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# Y3

*Lesson Plan 96*

| *Activity* | | *Notes* |
|---|---|---|
| **5** | **Estimation**<br>Let's estimate the difference by rounding to the nearest 100, then calculate it exactly. Ps come out to BB or dictate to T.<br>BB: | Whole class activity<br>Use enlarged copy master or OHP or model money stuck to BB.<br>Reasoning, agreement, praising<br>Ps can do the calculations in their *Ex. Bks.* |
| | a) Had: 100 100 100 20 20 5 → 245 ≈ 200; Spent: 20 20 5 5 20 → 55 ≈ 100<br>Difference: 200 – 100 = 100 (Too rough)<br>Exact amount: 245 – 55 = 190 | |
| | b) Had: 100 100 100 20 20 10 5 → 355 ≈ 400; Spent: 100 20 20 5 → 145 ≈ 100<br>Difference: 400 – 100 = 300 (Too rough)<br>Exact amount: 355 – 145 = 210 | |
| | c) Had: 100 100 100 50 10 100 5 → 465 ≈ 500; Spent: 100 100 50 → 250 ≈ 300<br>Difference: 500 – 300 = 200 (o.k)<br>Exact amount: 465 – 250 = 215 | Involve several Ps in discussion about the estimates.<br>Agreement that<br>• care must be taken when estimating in subtractions;<br>• it is better to use more accurate estimates (e.g. to nearest 10). |
| | d) Had: 100 100 100 100 100 100 20 20 5 → 649 ≈ 600; Spent: 100 20 5 → 125 ≈ 100<br>Difference: 600 – 100 = 500 (o.k.)<br>Exact amount: 649 – 125 = 524 | |
| | Do you think the estimates are close enough to the exact amount?<br>a) Number being subtracted from (reductant) has been rounded down and number being subtracted (subtrahend) has been rounded up, i.e. more is being subtracted from less. The estimate is too small.<br>b) Number being subtracted from (reductant) has been rounded up and number being subtracted (subtrahend) has been rounded down, i.e. less is being subtracted from more. The estimate is too big.<br>c) Both numbers have been rounded up, so estimate is quite close.<br>d) Both numbers have been rounded down, so estimate is quite close. | Ps do the estimates again orally by rounding to the nearest 10.<br>a) *E*: 250 – 60 = 190<br>b) *E*: 360 – 150 = 210<br>c) *E*: 470 – 250 = 220<br>d) *E*: 650 – 130 = 520<br>(Agree that all are closer than previous estimates) |
| | *26 min* | |
| **6** | ***PbY3b, page 96***<br>Q.1 Read: *Change the prices of the soft toys to pence. By rounding the prices to the nearest 10 p, estimate the difference between:*<br>*a) the bear and the cat*<br>*b) the elephant and the tortoise*<br>*c) the elephant and the cat*<br>*d) the tortoise and the bear.*<br>Prices in pence reviewed orally before Ps do parts a) to d). Review at BB with whole class. Mistakes corrected. Ask Ps to give estimates orally as £s and pence. | Individual work, monitored, helped<br>Drawn on BB or use enlarged copy master or OHP<br>Reasoning, agreement, self-correcting, praising<br>BB: (in pence)<br>a) B – C ≈ 550 – 360 = 190<br>b) E – T ≈ 870 – 650 = 220<br>c) E – C ≈ 870 – 360 = 510<br>d) T – B ≈ 650 – 550 = 100 |
| **Extension** | Calculate the exact costs. (T can check with a calculator.) | |
| | *32 min* | |

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# Y3

*Lesson Plan 96*

| *Activity* | | *Notes* |
|---|---|---|
| **7** | ***PbY3b, page 96***<br>Q.2 Read: *Circle the correct answers.*<br>Make sure Ps know that only one number in each row should be circled. Ps can do calculations in *Ex. Bks*. Deal with one part at a time.<br>a) Read: *Estimate the difference between 678 and 432*<br>*i) by rounding to the nearest 100* *[100, 200, 300, 400]*<br>*ii) by rounding to the nearest 10.* *[240, 250, 260, 270]*<br>Review at BB with whole class. Ps explain their solutions. Class agrees/disagrees. Mistakes discussed and corrected.<br>b) Read: *Estimate the difference between 582 and 147*<br>*i) by rounding to the nearest 100* *[100, 300, 500, 700]*<br>*ii) by rounding to the nearest 10.* *[420, 430, 440, 540]*<br>Review at BB with whole class. Ps explain their solutions. Class agrees/disagrees. Mistakes discussed and corrected.<br>*36 min* | Individual work, monitored, helped<br>T has possible numbers written on BB or SB or OHP<br>Reasoning, agreement, self-correcting, praising<br>BB: 678 – 432 ≈<br>i) 700 – 400 = 300<br>ii) 680 – 430 = 250<br>Reasoning, agreement, self-correcting, praising<br>BB: 582 – 147 ≈<br>i) 600 – 100 = 500<br>ii) 580 – 150 = 430 |
| **8** | ***PbY3b, page 96***<br>Q.3 Read: *Estimate the difference by rounding the numbers to the nearest 10.*<br>Let's see how many you can do in 2 minutes! Start . . . now!<br>Review at BB with whole class. Mistakes discussed /corrected.<br>*Solution*:<br>a) 674 – 466 ≈ 670 – 470 = 200<br>b) 682 – 444 ≈ 680 – 440 = 240<br>c) 639 – 451 ≈ 640 – 450 = 190<br>d) 926 – 543 ≈ 930 – 540 = 390<br>e) 918 – 550 ≈ 920 – 550 = 370<br>*40 min* | Individual work, monitored, helped<br>Written on BB or use enlarged copy master or OHP<br>Differentiation by time limit<br>Reasoning, agreement, self-correcting, praising<br>**Extension**<br>Able Ps finished quickly can write exact differences beside estimates. |
| **9** | **Rounding and calculation practice**<br>What could this table mean? Ask several Ps what they think.<br>BB:<br>3-digit numbers suggested by Ps<br>If nobody knows, T explains.<br>*A* and *B* are 3-digit numbers. $A > B$<br>$H = A - B$ after rounding *A* and *B* to the nearest 100. (800 – 500)<br>$T = A - B$ after rounding *A* and *B* to the nearest 10. (830 – 540)<br>Let's complete the table. Deal with one column at a time.<br>Ps come to BB to write possible numbers in table (or dictate to T).<br>Then Ps round the numbers and write the differences in rows *H* and *T*, explaining reasoning. Class checks whether they are correct.<br>*45 min* | Whole class activity<br>Drawn on BB or use enlarged copy master or OHP<br>Allow Ps to explain the table if they can. (T can give hints.)<br>Ps suggest the pairs of 3-digit numbers.<br>Involve as many Ps as possible (one step each)<br>At a good pace<br>Reasoning, checking, agreement, praising<br>Feedback for T<br>(Ps can have copies of table and complete it at home if they wish.) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| *A* | 832 | | | | | | |
| *B* | 543 | | | | | | |
| *H* | 300 | | | | | | |
| *T* | 290 | | | | | | |

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# Y3

R: Mental calculation. Vertical addition
**C: Mental subtraction**
*E: Numbers up to 2000*

## *Lesson Plan* 97

| *Activity* | | *Notes* |
|---|---|---|
| **1** | **Estimating differences**<br>Let's estimate the difference between the prices of the books. Talk about what the prices mean. (e.g. £7.67 means £7 and 67 hundredths of a £ (i.e. £7 and 67 p)<br>What should we do first to make it easier for us? (Change the £s to p)<br>Ps dictate the prices in pence to T and T writes inside the books.<br>a) £7.67 (767 p) – £4.57 (457 p)<br>to nearest 100 p: 800 – 500 = 300<br>to nearest 10 p: 770 – 460 = 310<br>b) £9.58 (958 p) – £6.32 (632 p)<br>to nearest 100 p: 1000 – 600 = 400<br>to nearest 10 p: 960 – 630 = 330<br>c) £8.46 (846 p) – £5.23 (523 p)<br>to nearest 100 p: 800 – 500 = 300<br>to nearest 10 p: 850 – 520 = 330<br>*5 min* | Whole class activity<br>Books drawn on BB or use enlarged copy master or OHP (or use real books with prices attached on card)<br>Ps come to BB to round the numbers in their heads and to write the subtractions.<br>Class agrees/disagrees<br>At a good pace<br>Discussion, reasoning, agreement, checking, praising<br>Feedback for T |
| **2** | **Sequences**<br>T says first few terms of a sequence. Ps continue and give the rule.<br>a) 830, 760, 690, (620, 550, 480, 410, 340, 270, 200, 130, . . .)<br>*Rule:* Decreasing by 70 (– 70)<br>b) 60, 95, 130, (165, 200, 235, 270, 305, 340, 375, 410, . . .)<br>*Rule:* Increasing by 35 (+ 35)<br>What is the connection between a) and b)? (terms in a) are also in b)<br>c) Write 487 in your *Ex. Bks* in the middle of the row. Write the 5 terms before and the 5 terms after 487 if the rule is + 16.<br>Review by class reading sequence aloud and Ps standing up if they made a mistake or did not reach that term.<br>. . ., 407, 423, 439, 455, 471, 487, 503, 519, 535, 551, 567, . . .<br>*12 min* | Whole class activity<br>T chooses Ps at random<br>At a good pace<br>Agreement on the rule<br>Reasoning, agreement, praising<br>Individual work, monitored<br>Set a time limit<br>In unison.<br>Discussion, self-correction, praising. In good humour! |
| **3** | ***PbY3b, page 97***<br>Q.1 Read: *Fill in the missing numbers.*<br>T (or P) explains task using completed column. (Ps might notice that numbers in bottom row are 100 less than those in top row.)<br>Review at BB with the whole class. Mistakes corrected.<br>*Solution:*<br>– 60: **340** 620 530 310 900 470 783 939<br>**400** **680** **590** **370** **960** **530** **843** **999**<br>– 160: **240** 520 430 210 800 370 683 839<br>*17 min* | Individual work, monitored, (helped)<br>Written on BB or use enlarged copy master or OHP<br>Ps come to BB or T writes what Ps dictate.<br>Discussion, reasoning, agreement, self-correcting, praising<br>**Bold** numbers are missing |

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# Y3

*Lesson Plan 97*

| *Activity* | | *Notes* |
|---|---|---|
| **4** | **Secret numbers**<br>Listen carefully and work out the number I am thinking of.<br>You may do any calculations in your *Ex. Bks*. Show me the number when I say.<br>a) *I am thinking of a number. It is 180 more than the difference between 730 and 390. What is the number?*<br>Show me . . . now! (520) **A**, explain to us how you worked it out. Who agrees? Who did it another way? etc.<br>e.g. $730 - 390 + 180 = 340 + 180 = 440 + 80 = \underline{520}$<br>or $730 - 390 = 340$, $340 + 180 = \underline{520}$, or $x \overset{180}{>} 730 \overset{340}{-} 390$<br>b) *I am thinking of a number. It is 200 less than the difference between 580 and 250. What is the number?*<br>Show me . . . now! (130) **B,** explain to us how you worked it out. Who agrees? Who did it another way? etc.<br>e.g. $580 - 250 - 200 = 330 - 200 = \underline{130}$, or $x \overset{200}{<} \overset{330}{580 - 250}$<br>or $580 - 250 = 330$, $330 - 200 = \underline{130}$ | Whole class activity<br>Answers written on scrap paper or 'slates'<br>T repeats slowly<br>Give Ps time to calculate<br>In unison.<br>Reasoning, agreement, praising<br>*Check:* $520 - 180 = 340$ ✔<br>T repeats slowly<br>Give Ps time to calculate<br>In unison.<br>Reasoning, agreement, praising<br>*Check:* $130 + 200 = 330$ ✔ |
| | *22 min* | |
| **5** | **Calculation practice**<br>I wonder how well you remember the 4 operations. ( +, –, ×, ÷)<br>Elicit the order of calculation. Do these calculations in your *Ex. Bks*.<br>T dictates and Ps write in *Pbs*, writing the answer too.<br>a) $9 \times 6 + 110 = (164)$ b) $28 \div 4 = (7)$ c) $(100 - 20) \div 5 = (16)$<br>$145 - 10 \times 9 = (55)$ $4 \times 0 = (0)$ $(60 + 20) \times 6 = (480)$<br>$81 + 180 \div 9 = (101)$ $56 \div 7 = (8)$ $200 \div 4 - 48 = (2)$<br>$180 \div 6 + 97 = (127)$ $9 \times 8 = (72)$ $(200 - 48) \div 4 = (38)$<br>Deal with one part at a time. Review with whole class. Ps explain how they did the calculations. Mistakes discussed and corrected.<br>Write difficult calculations on the BB, e.g.<br>$(100 - 20) \div 5 = 80 \div 5 = 50 \div 5 + 30 \div 5 = 10 + 6 = 16$<br>$(200 - 48) \div 4 = 152 \div 4 = 160 \div 4 - 8 \div 4 = 40 - 2 = 38$ | Individual work, monitored (part c) helped)<br>T could have BB or SB or OHT already prepared and uncover each answer as it is dealt with.<br>Reasoning, agreement, self-correction, praising<br>Deal with all cases<br>or<br>$100 \div 5 - 20 \div 5 = 20 - 4 = \underline{16}$<br>$200 \div 4 - 48 \div 4 = 50 - 12 = \underline{38}$ |
| | *27 min* | |
| **6** | ***PbY3b, page 97***<br>Q.2 Read: *Compare the two sides. Fill in the missing signs.*<br>Look carefully at the questions. You might not need to do all the calculations! Review at BB with whole class. Mistakes corrected. Ps explain their reasoning, with or without* calculation.<br>How many more is the greater side?<br>*Solution:*<br>a) $300 + 800 \overset{1100}{\underset{200}{\boxed{<}}} 400 + 900 \overset{1300}{}$<br>b) $126 - 34 \overset{92}{\underset{8}{\boxed{>}}} 46 + 38 \overset{84}{}$<br>c) $1000 - 400 \overset{600}{\underset{200}{\boxed{<}}} 1200 - 400 \overset{800}{}$<br>d) $6 \times 40 \overset{240}{\boxed{=}} 60 \times 4 \overset{240}{}$<br>e) $1500 - 800 \overset{700}{\underset{200}{\boxed{>}}} 1400 - 900 \overset{500}{}$<br>f) $420 \div 7 \overset{60}{\underset{\times 10\ (54)}{\boxed{>}}} 420 \div 70 \overset{6}{}$ | Individual work, monitored (helped)<br>T has BB or SB or OHT already prepared<br>Discussion, reasoning, agreement, self-correction, praising<br>* e.g. in a):<br>each term on RHS is 100 more than equivalent term on LHS, so RHS is 200 more than LHS.<br>Extra praise for Ps who correctly reason in this way. |
| | *32 min* | |

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# Y3

*Lesson Plan 97*

## *Activity*

**7**

***PbY3b, page 97, Q.3***

T chooses a P to come to front to read each part. Ps write subtractions and inequalities in *Pbs*, then write the difference on scrap paper or 'slate'. P at front asks class to show difference on command.

a) *The smallest 4-digit number compared with the greatest 3-digit number.*
Allow time for calculations. Show me . . . now! (1)
**B**, explain how you got your answer. Who agrees? etc.

b) *The smallest 4-digit number compared with the smallest 3-digit number.*
Allow time for calculations. Show me . . . now! (900)
**C**, explain how you got your answer. Who agrees? etc.

c) *The smallest 4-digit number compared with the smallest 2-digit number.*
Allow time for calculations. Show me . . . now! (990)
**D**, explain how you got your answer. Who agrees? etc.

d) *The greatest 3-digit whole ten compared with the greatest 3-digit hundred.*
Allow time for calculations. Show me . . . now! (90)
**E**, explain how you got your answer. Who agrees? etc.

e) *The smallest 4-digit hundred compared with the smallest 4-digit whole ten.*
Allow time for calculations. Show me . . . now! (0)
**F**, explain how you got your answer. Who agrees? etc.

f) *The smallest whole hundred compared with the smallest whole ten.*
Allow time for calculations. Show me . . . now! (90)
**G**, explain how you got your answer. Who agrees? etc.

*38 min*

## *Notes*

Whole class activity
(or individual work if Ps prefer, reviewed orally with whole class)

P repeats slowly

In unison

Reasoning, agreement, self-correcting, praising

BB:

a) $1000 - 999 = 1$
$1000 > 999$
$\quad\quad\ 1$

b) $1000 - 100 = 900$
$1000 > 100$
$\quad\quad\ 900$

c) $1000 - 10 = 990$
$1000 > 10$
$\quad\quad\ 990$

d) $990 - 900 = 90$
$990 > 900$
$\quad\ 90$

e) $1000 - 1000 = 0$
$1000 = 1000$

f) $100 - 10 = 90$
$100 > 10$
$\quad\ 90$

**8**

***PbY3b, page 97***

Q.4 Read: *Fill in the missing numbers and write the rule.*

Look at the two complete columns to find the rule. Fill in the numbers missing from the next 3 columns.

T brings class together to discuss the rule and review the 3 columns. Ps explain reasoning. Class agrees/disagrees.

Ps complete the remaining columns in the table. (Difficult calculations can be done in *Ex. Bks.)*

Review at BB with whole class. Ps explain their reasoning. Class agrees/disagrees. Mistakes discussed and corrected.

*Solution:*

| | | | | | | | | * | * |
|---|---|---|---|---|---|---|---|---|---|
| ✿ | 670 | 1000 | 549 | 394 | 777 | **893** | 987 | 573 | 464 |
| 🍄 | 420 | 814 | 231 | 384 | 555 | 618 | **555** | 348 | 59 |
| 🍐 | 250 | 186 | **318** | **10** | **222** | 275 | 432 | **225** | **405** |

✿ = 🍄 + 🍐 🍄 = ✿ − 🍐 🍐 = ✿ − 🍄

Individual work, monitored, helped

Table drawn on BB or use enlarged copy master or OHP

Discussion, reasoning, self-correction, praising

e.g.

$573 - 348 = 573 - 300 - 48$
$= 273 - 40 - 8$
$= 233 - 8 = \underline{225}$

$464 - 59 = 464 - 60 + 1$
$= 404 + 1 = \underline{405}$

**Bold** numbers are missing.

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# Y3

*Lesson Plan 97*

| ***Activity*** | | ***Notes*** |
|---|---|---|
| 8 | Q.4 (continued)<br>Read: *Do these calculations below.*<br>Ps write the pairs of numbers and the known answers in the grids as a vertical subtraction and try to explain the answers.<br>Ps reason at BB and class checks whethere they are correct.<br>If nobody has a suggestion, T explains using a place value table.<br>(8U cannot be taken away from 1U, so we move 1T (= 10U) from the tens column to the units column, leaving 6 tens in the tens column and making 10U + 3U = 13 units in the units column. 13U – 8U = 5U, so I write 5 in the units column in the answer, 6T – 4T = 2T, so I write 2 in the tens column in the answer; 5H – 3H = 2H, so I write 2 in the hundreds column in the answer; the difference is 225.)<br>Do the last column in a similar way.<br>*45 min* | Reasoning, agreement, praising<br>BB:<br>H T U<br>5 6 7 10 3<br>– 3 4 8<br>2 2 5<br><br>H T U<br>4 5 ~~6~~ 10 4<br>– 5 9<br>4 0 5<br><br>If a P has understood, allow him/her to explain final column.<br>If Ps do not understand, T tells them not to worry – we will learn it in another lesson! |

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# Y3

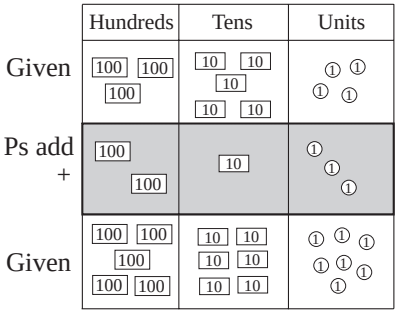
R: Mental calculation

**C: Pencil and paper procedures: subtraction: HTU – (H)TU**

*E: Numbers up to 2000*

## *Lesson Plan 98*

| *Activity* | | *Notes* |
|---|---|---|
| **1** | **Problem 1**<br>Listen carefully and think how you would solve this problem.<br>*Roger has £354. How much more does he need to save if he plans to buy a computer wich costs £567?*<br>Ps come to BB to write the data, plan and estimation of answer after rounding to the nearest 10. (Or Ps dictate to T what to write.)<br>BB: *Data*: R: £354, C: £567<br>*Plan*: C – R = £567 – £354<br>*E*: 567 – 354 ≈ 570 – 350 = 220<br>We can do the calculation in two ways, as an incomplete addition, or as a subtraction. T explains using these diagrams.<br>BB: Addition (incomplete): | Whole class activity<br>Ps suggest how to solve it<br>Reasoning, agreement, praising<br>Diagrams drawn on BB or use enlarged copy master or OHP (or stick model money on BB) |




| H | T | U |
|---|---|---|
| 3 | 5 | 4 |
| + 2 | 1 | 3 |
| 5 | 6 | 7 |

Short form

| | | | |
|---|---|---|---|
| | 3 | 5 | 4 |
| + | 2 | 1 | 3 |
| | 5 | 6 | 7 |

4U + 3U = 7U
5T + 1T = 6T
3H + 2H = 5H

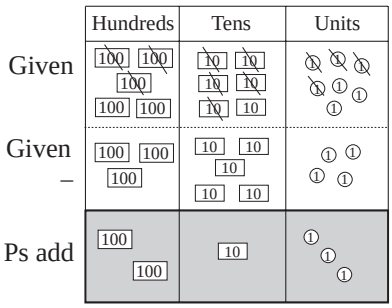
Ps come to BB to draw or stick model money on BB, and complete table and grid, explaining reasoning.

Class agrees/disagrees

T gives guidance where necessary.

Ps write short form in *Ex. Bks.*

or Subtraction:




| H | T | U |
|---|---|---|
| 5 | 6 | 7 |
| – 3 | 5 | 4 |
| 2 | 1 | 3 |

Short form

| | | | |
|---|---|---|---|
| | 5 | 6 | 7 |
| – | 3 | 5 | 4 |
| | 2 | 1 | 3 |

7U – 4U = 3U
6T – 5T = 1T
5H – 3H = 2H

Money subtracted can be crossed off (or taken away if on cards)

Reasoning explained in detail

Check by comparing with the estimate and by an addition

*Check:*

| | | | |
|---|---|---|---|
| | 2 | 1 | 3 |
| + | 3 | 5 | 4 |
| | 5 | 6 | 7 |

In unison

*Answer:* Roger needs to save another £213.

*11 min*

| | | |
|---|---|---|
| **2** | ***PbY3b, page 98***<br>Q.1 Read: *Complete the additions. Write a subtraction for each one.*<br>Deal with one part at a time. Review at BB with whole class. Ps explain reasoning. Class points out errors. Mistakes corrected.<br>*Solution:* | Individual work, monitored, helped<br>Written on BB or use enlarged copy master or OHP<br>Discussion, reasoning, agreement, self-correcting, praising<br>**Bold** numbers are missing<br>Compare the positions of the numbers in both operations.<br>Point out that adding the bottom 2 rows is a good check. |

a)

| | | | |
|---|---|---|---|
| | 5 | 4 | 3 |
| + | **3** | **3** | **2** |
| | 8 | 7 | 5 |

| | | | |
|---|---|---|---|
| | 8 | 7 | 5 |
| – | 5 | 4 | 3 |
| | **3** | **3** | **2** |

b)

| | | | |
|---|---|---|---|
| | 1 | 5 | 6 |
| + | **8** | **3** | **3** |
| | 9 | 8 | 9 |

| | | | |
|---|---|---|---|
| | 9 | 8 | 9 |
| – | 1 | 5 | 6 |
| | **8** | **3** | **3** |

c)

| | | | |
|---|---|---|---|
| | 2 | 1 | 7 |
| + | **4** | **4** | **2** |
| | 6 | 5 | 9 |

| | | | |
|---|---|---|---|
| | 6 | 5 | 9 |
| – | 2 | 1 | 7 |
| | **4** | **4** | **2** |

d)

| | | | |
|---|---|---|---|
| | 6 | 3 | 2 |
| + | **2** | **3** | **5** |
| | 8 | 6 | 7 |

| | | | |
|---|---|---|---|
| | 8 | 6 | 7 |
| – | 6 | 3 | 2 |
| | **2** | **3** | **5** |

e)

| | | | | |
|---|---|---|---|---|
| | 1 | 2 | 5 | 4 |
| + | | **6** | **4** | **2** |
| | 1 | 8 | 9 | 6 |

| | | | | |
|---|---|---|---|---|
| | 1 | 8 | 9 | 6 |
| – | 1 | 2 | 5 | 4 |
| | | **6** | **4** | **2** |

*17 min*

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# Y3

*Lesson Plan 98*

| *Activity* | | *Notes* |
|---|---|---|
| **3** | **Problem 2**<br>Listen carefully and think how you would solve the problem.<br>*Rory has 562 football cards, 237 cards more than Harry has. How many cards does Harry have?*<br>**X**, how would you solve it? Who agrees? Who would do it another way? etc. T writes what Ps dictate, or Ps come to BB. Show the calculations in a place-value table and a grid. Class agrees/disagrees.<br>*Data*: R: 562, H: R – 237 *Plan*: H: 562 – 237<br>*E*: (after rounding numbers to nearest 10) 560 – 240 = 320<br>*C*: H T U: 3 2 5; + 2 3 7; 5 6 12 or H T U: 5 5 6 10 2; – 2 3 7; 3 2 5. Short form: 5 6 2 – 2 3 7 = 3 2 5. *Check:* 320 ≈ 325; 3 2 5 + 2 3 7 = 5 6 2 ✔<br>Show as an incomplete addition, then as a subtraction. T demonstrates the subtraction in detail, pointing to the relevant columns, e.g.:<br>'I cannot take 7U away from 2U, so I move 1T across to the units column, leaving 5T in the tens column and making 10U + 2U = 12U in the units column; 12U – 7U = 5U; 5T – 3T = 2T; 5H – 2H = 3H; the difference is 325.'<br>Let's read the the question again and give the answer in a sentence.<br>*Answer:* Harry has 325 cards.<br>*25 min* | Whole class activity<br>T repeats slowly. P repeats in own words.<br>Reasoning, agreement, praising<br>Discuss how to do the calculation.<br>Check by comparing with the estimate and with the matching addition.<br>Ps can join in if they wish.<br>In unison. Praising |
| **4** | **Subtraction consolidation**<br>Let's complete the addition and write a subtraction about it. T writes what Ps dictate or Ps come to BB. Class agrees/disagrees.<br>BB:<br>a) 1 4 5 6; + 5 1 4; 9 7 0. 6U + 4U = 10U = 1T + 0U; 1T + 5T + 1T = 7T; 4H + 5H = 9H. 9 7 0 – 4 5 6 = 5 1 4<br>Let's explain the subtraction in a place-value table. (BB)<br>'I cannot take 6U away from 0U, so I move 1T across to the units column, leaving 6T in the tens column and making 10U + 0U = 10U in the units column; 10U – 6U = 4U; 6T – 5T = 1T; 9H – 4H = 5H; the difference is 514.'<br>Let's do another subtraction this way: 474 – 372.<br>b) 1 4 7 4; + 3 7 2; 8 4 6. 2U + 4U = 6U; 7T + 7T = 14T = 1H + 4T; 1H + 3H + 4H = 8H. 8 4 6 – 3 7 2 = 4 7 4<br>Let's explain the subtraction using a place-value table.<br>'6U –2U = 4U; 7T cannot be taken away from 4T, so I move 1H across to the tens column, leaving 7H in the hundreds column and making 10T + 4T = 14T in the tens column; 14T – 7T = 7T; 7H – 3H = 4H; the difference is 474.'<br>*30 min* | Whole class activity<br>Written on BB<br>Ps say addition in detail, as shown.<br>Subtraction is written initially by rearranging the terms in the addition.<br>BB:<br>(T, with Ps joining in.)<br>H T U: 9 6 7 10 0; – 4 5 6; 5 1 4<br>Ps write short form in *Ex. Bks.*<br>Ps say addition in detail, as shown.<br>Subtraction is written initially by rearranging the terms in the addition.<br>BB<br>(T, with Ps joining in.)<br>H T U: 7 8 10 4; – 3 7 2; 4 7 4<br>Ps write short form in *Ex. Bks.* |

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# Y3

*Lesson Plan 98*

| *Activity* | | *Notes* |
|---|---|---|
| **5** | ***PbY3b, page 98***<br>Q.2 Read: *Estimate the difference (by rounding to the nearest 10), then do the calculation.*<br>Check your answer by comparing with your estimate and by doing an addition in your *Ex. Bks*.<br>Review at BB with whole class: Ps explain reasoning. Class agrees/disagrees. Mistakes discussed and corrected.<br>*Solution*:<br>876 – 345 *E:* 880 – 350 = 530<br>8 7 6<br>– 3 4 5<br>5 3 1 | Individual work, monitored, helped<br>Reasoning, checking, agreement, self-correcting, praising<br>*Check*: 531 ≈ 530<br>531<br>+ 345<br>876 |
| **Extension** | Do these subtractions in your *Ex. Bks*. (T writes on BB)<br>BB:<br>746 – 305 *E:* 750 – 310 = 440<br>7 4 6<br>– 3 0 5<br>4 4 1<br>975 – 43 *E:* 980 – 40 = 940<br>9 7 5<br>– 4 3<br>9 3 2<br>Review with whole class. Mistakes discussed and corrected. | Ps check answers as before.<br>*Check*: 441 ≈ 440<br>441<br>+ 305<br>746<br>*Check*: 932 ≈ 940<br>932<br>+ 43<br>975 |
| | *35 min* | |
| **6** | ***PbY3b, page 98***<br>Q.3 Read: *Practise subtraction.*<br>Deal with one part at a time (a), b), c)). Ps check answers by estimating and adding mentally (or in *Ex. Bks*).<br>Review at BB with whole class. Mistakes discussed and corrected. If there are difficulties, show in a place-value table.<br>Has anyone noticed something about each part? (Differences are <u>decreasing</u> by the same amount because numbers being subtracted (subtrahend) are <u>increasing</u> by that amount, while the numbers being subtracted from (reductant) do not change.)<br>*Solution:*<br>a) i) 386 – 215 = **171**; ii) 386 – 216 = **170**; iii) 386 – 217 = **169**; iv) 386 – 218 = **168** (– 1 each step)<br>b) i) 768 – 245 = **523**; ii) 768 – 265 = **503**; iii) 768 – 285 = **483**; iv) 768 – 305 = **463** (– 20 each step)<br>c) i) 504 – 301 = **203**; ii) 504 – 311 = **193**; iii) 504 – 321 = **183**; iv) 504 – 331 = **173** (– 10 each step)<br>(Checking can also be done with a calculator.) | Individual work, monitored, helped<br>Written on BB or use enlarged copy master or OHP<br>If Ps are having difficulties, change to whole class activity<br>Discussion, reasoning, checking, agreement, praising<br>Problem calculations given in detail, e.g.<br>BB:<br>b) i)<br>H T U<br>$^{6}\not{7}$ $^{10}\rightarrow$6 8<br>– 2 8 5<br>4 8 3<br>c) iii)<br>H T U<br>$^{4}\not{5}$ $^{10}\rightarrow$0 4<br>– 3 3 1<br>1 7 3 |
| | *41 min* | |

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# Y3

*Lesson Plan 98*

| ***Activity*** | | ***Notes*** |
|---|---|---|
| **7** | ***PbY3b, page 98***<br>Q.4 Read: *Use the numbers in the clown to write subtractions. The difference should be the number in his hat.*<br>Review at BB with whole class. Ps discuss their strategies for solution and explain reasoning, Class checks that calculations are correct and suggests missed subtractions.<br>*Solution:*<br>$\begin{array}{r} 573 \\ -\ 221 \\ \hline 352 \end{array}$ $\begin{array}{r} 948 \\ -\ 596 \\ \hline 352 \end{array}$ $\begin{array}{r} 621 \\ -\ 269 \\ \hline 352 \end{array}$ $\begin{array}{r} 462 \\ -\ 110 \\ \hline 352 \end{array}$ | Individual work, monitored, helped<br>Use enlarged copy master or OHP of clown (or write numbers on BB)<br>If Ps are having difficulties, change to whole class activity<br>Discussion, reasoning, checking, agreement, praising<br>Check by estimation and addition. |
| **Extension** | What other questions can you think of to ask about the numbers in the clown?<br>(e.g. What is their total? How many odd (even) numbers? List them in increasing (decreasing) order, etc.) | Whole class discussion<br>Involve several Ps<br>Praise creative questions. |

*45 min*

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# Y3

R: Mental calculation
**C: Vertical subtraction**
*E: Numbers up to 2000*

## *Lesson Plan* *99*

| *Activity* | | *Notes* |
|---|---|---|
| **1** | **Missing numbers**<br>Study this table. The rule is: ▲ − 80 = ✿ (BB)<br>Ps come out to choose a column and fill in the missing number, explaining reasoning. Class points out errors.<br>BB: | Whole class activity<br>Table drawn on BB or use enlarged copy master or OHP<br>(or mushroom and flower can be cut out, coloured and stuck to BB for easier manipulation to show the rule)<br>At a good pace<br>Reasoning, agreement, praising<br>Feedback for T |

| ✿ | 790 | 830 | **400** | 950 | 440 | **600** | **750** | 710 | 620 | 519 | **857** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ▲ | **710** | **750** | 320 | **870** | **360** | 520 | 670 | **630** | **540** | **439** | 777 |

Who can write the rule in a different way?
(e.g. ▲ − ✿ = 80, or ✿ + 80 = ▲ )

*5 min*

| | | |
|---|---|---|
| **2** | **True or false?**<br>Are these statements true or false? Show me when I say. Hold your ears if you think it is true and knock once on your desk if you think it is false (or any other agreed actions, or T or F written on 'slates').<br>1. The difference between 680 and 450 is an even number. Show me . . . now! (T)<br>2. The difference between 680 and 450 is less than 250. Show me . . . now! (T)<br>3. The difference between 680 and 450 is 220. Show me . . . now! (F)<br>4. The difference between 680 and 450 is divisible by 10. Show me . . . now! (T) | Whole class activity<br>Ps can decide on the actions<br>T repeats each statement slowly to give Ps time to think.<br>Responses shown in unison<br>Ps who responded correctly explain to those who did not.<br>Agree that:<br>680 – 450 = 230 |

*9 min*

| | | |
|---|---|---|
| **3** | **Missing amounts**<br>Who can work out what value should be on the blank bank notes?<br>Ps come to BB to write in missing values, explaining reasoning. Class agrees/disagrees.<br>BB: (Shaded notes were blank)<br>a) 440 = 100 100 100 50 **50** 20 20<br>b) 540 = 100 100 100 50 50 **20** 20 20 20 20 20 20<br>c) 400 = 100 50 50 50 50 20 20 20 20 10 **10**<br>d) 580 = 100 50 **100** 50 50 50 100 20 20 20 20 | Whole class activity.<br>Drawn on BB or use enlarged copy master or OHP (or model money stuck to BB)<br>At a good pace<br>Discussion, reasoning, e.g.<br>a) 390 + 50 = 440<br>b) 540 – 520 = 20<br>c) 380 + 10 = 400<br>d) 580 – 480 = 100<br>Agreement, praising |

*13 min*

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# Y3

*Lesson Plan 99*

| *Activity* | | *Notes* |
|---|---|---|

**4**

**Differences**

What is the difference between the amounts of money in the 2 wallets?

Ps come out to BB to point to the bigger amount, then to estimate mentally and write a subtraction about it, saying each step loudly and clearly. Class checks with mental addition. (e.g. 2U + 4U = 6U, 4T + 5T = 9T, 3H + 1H = 4H, etc.) Show part c) in a place-value table.

BB:

*E*: 500 – 150 = 350

a) £496 £154

| | | | |
|---|---|---|---|
| | 4 | 9 | 6 |
| – | 1 | 5 | 4 |
| | 3 | 4 | 2 |

350 ≈ 342

↑ *Check:*

*E*: 590 – 330 = 260

b) £332 £585

| | | | |
|---|---|---|---|
| | 5 | 8 | 5 |
| – | 3 | 3 | 2 |
| | 2 | 5 | 3 |

260 ≈ 253

↑ *Check:*

*E*: 800 – 680 = 120

c) £798 £679

| | | | |
|---|---|---|---|
| | 7 | 9 | 8 |
| – | 6 | 7 | 9 |
| | 1 | 1 | 9 |

120 ≈ 119

↑ *Check:*

| | H | T | U |
|---|---|---|---|
| | 7 | $^{8}\cancel{9}$ | $^{10}8$ |
| – | 6 | 7 | 9 |
| | 1 | 1 | 9 |

Discuss other methods of checking. (horizontal subtraction, calculator)

e.g. 798 – 679 = 798 – 600 – 79 = 198 – 80 + 1 = 118 + 1 = <u>119</u>

*18 min*

Whole class activity

Drawn on BB or use enlarged copy master or OHP

Ps can do calculations in *Ex. Bks* first if they wish and then dictate to T what to write on the BB.

Discussion, reasoning, checking, agreement, praising

Detailed reading of calculations, e.g. in c):

'I can't take 9U away from 8U, so I move 1T across to the units column, leaving 8T in the tens column and making 18U in the units column; 18U – 9U = <u>9U</u>; 8T – 7T = <u>1T</u>; 7H – 6H = <u>1H;</u> the difference is 119.'

Also explain part c) with model money stuck to BB if necessary

**5**

**Equal values**

Let's join up the differences to their value rounded to the nearest 10.

Ps come to BB to choose a subtraction, do the calculation (explaining reasoning in detail) and join it to its nearest 10 (or rearrange 'roofs' and 'walls'). Class checks with mental addition. If problems, show reasoning in place-value tables.

BB:

230 540 410 270

| | | | |
|---|---|---|---|
| 628 | 574 | 845 | 837 |
| – 214 | – 341 | – 573 | – 299 |
| **414** | **233** | **272** | **538** |

↑ *Check* (+)

Discuss the different rounded values when rounding is done <u>before</u> calculation (in estimating) and <u>after</u> calculation (as here).

(e.g. *E*: 628 – 214 ≈ 630 – 210 = 420 <u>but</u> 628 – 214 = 414 ≈ 410

*E:* 845 – 573 ≈ 850 – 570 = 280 <u>but</u> 845 – 573 = 272 ≈ 270

Why is that? (e.g. 628 is rounded up and 214 is rounded down so the estimated difference is much more than the calculated difference.)

**Extension**

Who can think of other quick ways we could check the subtractions? T gives hints if nobody can think of any.

*24 min*

Whole class activity

Drawn on BB or use enlarged copy master or OHP (or the 'roofs' and 'walls' enlarged, cut out and stuck separately to BB for Ps to make 'houses')

Ps write the operations in their *Ex. Bks.* first.

At a good pace

Discussion, explanation, reasoning, checking, agreement, praising

Other quick checks: e.g.

628 – 214 = 628 – 228 + 14
= 400 + 14 = <u>414</u>

837 – 299 = 837 – 300 + 1
= 537 + 1 = 538

Extra praise if Ps suggest it.

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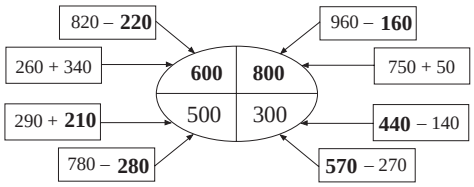
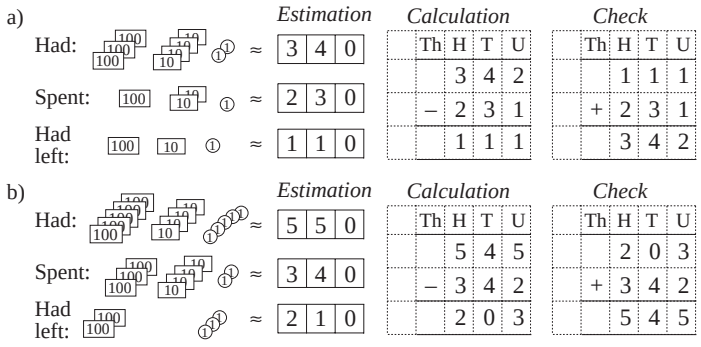
# Y3

*Lesson Plan 99*

| *Activity* | | *Notes* |
|---|---|---|
| **6** | ***PbY3b, page 99***<br>Q.1 Read: *Fill in the missing numbers.*<br>Discuss and agree on the rule. Ps complete diagram in *Pbs*.<br>Review at BB with whole class. Mistakes corrected.<br>*Solution:*<br>  <br><br>*29 min* | Individual work, monitored (helped)<br>Initial whole class discussion<br>Drawn on BB or use enlarged copy master or OHP<br>Reasoning, checking, agreement, self-correction, praising<br>**Bold** numbers are missing |
| **7** | ***PbY3b, page 99***<br>Q.2 Read: *How much money did we have left after our holiday? Complete the drawing. Estimate by rounding to the nearest whole ten. Do the calculation and check it.*<br>T explains task in context. Deal with one part at a time, keeping Ps together at each step. Agree that check can be done by comparing with the estimate and then by writing an addition.<br>Review at BB with whole class. Ps come to BB to write and explain (or dictate to T). Class agrees/disagrees. Mistakes discussed and corrected.<br>*Solution:*<br>a)<br>  <br><br>b)<br><br><br>*35 min* | Individual work, monitored (helped)<br>Drawn on BB or use enlarged copy master or OHP<br>Reasoning, agreement, checking, self-correction, praising<br>Ps explain calculations in detail.<br>In b) Ps write in the column headings too. (Agree that the thousands column is not needed here)<br>Discuss why estimate for b) is 210 although 203 ≈ 200.<br>(Reductant rounded up, subtrahend rounded down, so estimated difference is much more than exact difference.) |

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# Y3

*Lesson Plan 99*

| *Activity* | | *Notes* |
|---|---|---|
| **8** | ***PbY3b, page 99***<br>Q.3 Read: *Estimate the difference by rounding the numbers to the nearest whole ten. Do the calculation, then check it in your head with an addition.*<br>Elicit that there are 2 × 10 subtractions. Let's see how many you can do in 3 minutes! Start . . . now! . . . Stop!<br>Review at BB with whole class. Ps explain reasoning in detail. Class agrees/disagrees. Mistakes discussed and corrected.<br>*Solution:*<br>a) i) 943 − 612 = 331, *E:* 330; ii) 785 − 245 = 540, *E:* 540; iii) 847 − 346 = 501, *E:* 500; iv) 1864 − 1352 = 512, *E:* 510; v) 1756 − 652 = 1104, *E:* 1110<br>b) i) 872 − 356 = 516, *E:* 510; ii) 780 − 357 = 423, *E:* 420; iii) 825 − 609 = 216, *E:* 220; iv) 735 − 482 = 253, *E:* 260; v) 903 − 571 = 332, *E:* 330 | Individual work, monitored helped<br>(Or part b) done as whole class activity if T prefers)<br>Written on BB or use enlarged copy master or OHP<br>Differentiation by time limit<br>Reasoning, checking, agreement, self-correction, praising<br>How did you check your answers? e.g. mentally by adding bottom 2 rows in subtraction to make the top row, or doing subtraction again horizontally, e.g.<br>872 – 356 = 872 – 300 – 56<br>= 572 – 50 – 6<br>= 522 – 6 = 516 |
| | *40 min* | |
| **9** | **Problem**<br>Listen carefully, write the data, do the calculation and check the result in your *Ex. Bks*. Show me the answer when I say.<br>*Sam and Rosie were on holiday at the seaside. They collected 342 shells altogether. If Sam collected 127 shells, how many did Rosie collect?*<br>Show me . . . now! (215)<br>**X,** explain to us how you got your answer. Who agres? Who did it a different way? Who made a mistake? What was your mistake? etc.<br>BB:<br>*Data*: S + R: 342, S: 127 *Plan*: R: 342 – 127<br>*E*: 342 – 127 ≈ 340 – 130 = 210<br>or 342 – 127 = 342 – 100 – 27<br>= 242 – 20 – 7<br>= 222 – 7 = 215<br>*C*: 342 − 127 = 215 ↑ *Check* (+)<br>*Answer*: Rosie collected 215 shells. | Whole class activity<br>T repeats slowly and P repeats in own words.<br>Give Ps time to think/calculate<br>In unison (on scrap paper or 'slates')<br>Reasoning, checking with estimate, agreement, self-correcting, praising<br>Accept any method which gives the correct answer.<br>Explain calculation in a place-value table if necessary.<br>Further checks can be done mentally, in *Ex. Bks*, or with a calculator |
| | *45 min* | |

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| **Y3** | | *Lesson Plan* *100* |
|---|---|---|
| ***Activity*** | | ***Notes*** |
| | Calculation and tables practice, revision, activities, consolidation.<br>*PbY3b, page 100* | |

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# Y3

R: Mental calculation

**C: Subtraction. Problems in context**

*E: Numbers up to 2000*

## *Lesson Plan 101*

| *Activity* | | *Notes* |
|---|---|---|

### 1

**Number snake**

Which numbers do you think are missing from the snake? Ps come out to fill in the missing terms, explaining reasoning. What is the rule? (Decreasing by 40, or – 40)

BB:

730 | **690** | **650** | 610 | **570** | 530 | **490** | 450 | 410 | 370 | 330 | 290 | 250 | -

*3 min*

Whole class activity

Drawn on BB or use enlarged copy master or OHP

At a good pace

Reasoning, agreement, praising

**Bold** numbers are given.

### 2

**Analysing mistakes**

*Tommy Turtle* did these subtractions for homework. Let's estimate to see whether he is correct or not and find what mistakes he has made.

Ps come to BB or OHP to estimate, cross out wrong answers, explain the mistakes and do the calculations again correctly.

BB:

a) $\begin{array}{r} 1648 \\ -\ 132 \\ \hline \cancel{328} \end{array}$ *E:* 1650 – 130 = 1520 *Correction:* $\begin{array}{r} 1648 \\ -\ 132 \\ \hline 1516 \end{array}$ or $\begin{array}{r} 1648 \\ -1320 \\ \hline 328 \end{array}$

b) $\begin{array}{r} 1679 \\ -\ 56 \\ \hline \cancel{1119} \end{array}$ *E:* 1680 – 60 = 1620 *Correction:* $\begin{array}{r} 1679 \\ -\ 56 \\ \hline 1623 \end{array}$ or $\begin{array}{r} 1679 \\ -\ 560 \\ \hline 1119 \end{array}$

c) $\begin{array}{r} 725 \\ -\ 467 \\ \hline \cancel{342} \end{array}$ *E:* 730 – 470 = 260 *Correction:* $\begin{array}{r} 725 \\ -\ 467 \\ \hline 258 \end{array}$ *Check:* $\begin{array}{r} 258 \\ +\ 467 \\ \hline 725 \end{array}$ ✔

d) $\begin{array}{r} 845 \\ -\ 325 \\ \hline \cancel{52} \end{array}$ *E:* 850 – 330 = 520 *Correction:* $\begin{array}{r} 845 \\ -\ 325 \\ \hline 520 \end{array}$ *Check:* $\begin{array}{r} 520 \\ +\ 325 \\ \hline 845 \end{array}$ ✔

How can we check that the new answer is correct? (Compare with estimate, then addition or horizontal subtraction*, or use a calculator )

* e.g. a) 1648 – 132 = 1648 – 100 – 32 = 1548 – 32 = <u>1516</u>

*10 min*

Whole class activity

Written on BB or use enlarged copy master or OHP

At a good pace

Reasoning, agreement, checking, praising

Feedback for T

Show part c) in a place value table, giving the steps of the calculation in detail.

↓

| | H | T | U |
|---|---|---|---|
| | $^{6}\cancel{7}$ | $^{10}_{1}\cancel{2}$ | $^{10}5$ |
| – | 4 | 6 | 7 |
| | 2 | 5 | 8 |

or

| | H | T | U |
|---|---|---|---|
| | 7 | $^{10}2$ | $^{10}5$ |
| – | $4_1$ | $6_1$ | 7 |
| | 2 | 5 | 8 |

↑

T introduces another way of doing subtraction (adding 10U to the reductant and 1T to the subtrahend) Agree that if the same amount is added to each number, the difference will be the same. e.g. 7 – 5 = 17 – 15 T explains the steps in detail.

### 3

**Missing numbers**

Let's fill in the missing numbers to make the statements true.

BB:

a) $\begin{array}{r} 845 \\ -672 \\ \hline \boxed{173} \end{array}$ ↓ < 100 → $\begin{array}{r} \boxed{945} \\ -672 \\ \hline \boxed{273} \end{array}$ ↑

b) $\begin{array}{r} 1076 \\ -\ 491 \\ \hline \boxed{585} \end{array}$ > 200 $\begin{array}{r} 976 \\ -\boxed{591} \\ \hline \boxed{385} \end{array}$

c) $\begin{array}{r} 856 \\ -245 \\ \hline \boxed{611} \end{array}$ = $\begin{array}{r} 756 \\ -\boxed{145} \\ \hline \boxed{611} \end{array}$

d) $\begin{array}{r} 917 \\ -\ 583 \\ \hline \boxed{334} \end{array}$ = $\begin{array}{r} \boxed{717} \\ -\ 383 \\ \hline \boxed{334} \end{array}$

Ps come to BB to do calculations on LHS, explaining reasoning. Then they write the answer in the RHS and find the missing number by doing an addition. Class points out errrors.

*15 min*

Whole class activity

Written on BB or use enlarged copy master or OHP

Ps suggest where to start and how to continue.

Discussion, reasoning, checking, agreement, praising

Extra praise if Ps reason how to find the missing numbers <u>without</u> calculation

e.g. in a):
same number is subtracted so reductant <u>must</u> be 100 more.

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# Y3

*Lesson Plan 101*

| *Activity* | | *Notes* |
|---|---|---|
| **4** | **How does it work?**<br>I saw another interesting way to do subtraction This is it.<br>Can anyone explain how it works?<br>BB: a) 476 − 345 = 131<br>b) 345 − 138 = 21③ → 210 – 3 = 207<br>c) 539 − 294 = 3⑥5 → 305 – 60 = 245<br>d) 643 − 389 = 3④⑥ → 300 – 46 = 254<br>Give several Ps the chance to explain what they think. If no P is on the right track T can give hints. Then T explains step by step. e.g. in:<br>b) In all columns, subtract the bigger digit from the smaller digit. Only the units column was wrong, so ignore the 3U in the answer, leaving 2H and 1T = 210. But 8U is 3U more than 5U, so another 3U must be taken away from 210: 210 – 3 = 207.<br>c) In all columns, subtract the bigger digit from the smaller digit. The tens and units columns were wrong, so ignore the 4T and the 6U in the answer, leaving 3H = 300. But 8T is 4T more than 4T and 9U is 6U more than 3U, so 4T + 6U (= 46) must be taken away from 300: 300 – 40 – 6 = 260 – 6 = 254 .<br>*20 min* | Whole class activity<br>Written on BB or use enlarged copy master or OHP<br>Give Ps time to discuss it with their neighbours.<br>Discussion, explanation, agreement, praising<br>i.e. we have only subtracted 130 from 340 so far.<br>Ps check it is correct using another method.<br>i.e. we have only subtracted 300 from 600 so far.<br>Extra praise if Ps realise what is happening by themselves! |
| **5** | ***PbY3b, page 101***<br>Q.1 Read: *Fill in the missing numbers. Continue the pattern once more.*<br>T explains task. (The answer to the first subtraction is the top number in the 2nd, the answer to the 2nd subtraction is the top number in the 3rd, etc. Ps make up a 6th subtraction, using the answer from the 5th as the reductant.)<br>Review at BB with whole class. Ps explain reasoning and class agrees/disagrees. Mistakes discussed and corrected.<br>Ask Ps for methods of calculating 302 – 149: e.g.<br>• horizontal subtraction:<br>302 – 149 = 202 – 49 = 162 – 2 – 7 = 160 – 7 = 153, or<br>302 – 149 = 300 – 147 = 200 – 47 = 160 – 7 = 153, etc.<br>• using new method from *Activity 2*: $3^{10}0^{10}2 - 1_1 4_1 9 = 153$ T explains steps in detail. Use a place-value table if necessary.<br>• using method from *Activity 4*: 302 − 149 = 2④⑦ → 200 – 47 = 153 T explains steps (with Ps' help)<br>*Solution*:<br>868 − 213 = 655; 655 − 132 = 523; 523 − 221 = 302; 302 − 149 = 153; 153 − 33 = 120; e.g. 120 − 20 = 100<br>*26 min* | Individual work, monitored, helped<br>Drawn on BB or use enlarged copy master or OHP<br>Discussion, agreement, checking, self-correction<br>Praise each correct subtraction.<br>Extra praise for doing the difficult calculation correctly and for creating a new one.<br>e.g.<br>BB:<br>H T U<br>3 +10 0 +10 2<br>− 1 +1 4 +1 9<br>1 5 3<br>T tells Ps not to worry if they do not understand all the methods of calculation as we will do them again in another lesson.<br>You have all been very clever! |

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# Y3

*Lesson Plan 101*

| *Activity* | | *Notes* |
|---|---|---|
| **6** | ***PbY3b, page 101***<br>Q.2 Read: *One of these statements is <u>not</u> correct. Circle its sign.*<br>Ps read statements themselves and do any calculations in their *Ex. Bks*.<br>Review with whole class. Ps can draw large sign on scrap paper or 'slates' and show on command. (☆)<br>Ps with correct responses explain to Ps who were wrong. Mistakes discussed and corrected.<br>*Solution:*<br>✳ *The difference between 597 and 389 is 208.*<br>389 + 200 + 8 = 589 + 8 = 597 ✔<br>✠ *The difference between 589 and 397 is less than one thousand.* (Difference < 589 < 1000) ✔<br>☆ *The difference between 687 and 265 is an odd number.*<br>7U – 5U = 2U, so number must be <u>even</u>, not odd.<br>597 − 389 = 208<br>589 − 397 = 192<br>687 − 265 = 422 | Individual work, monitored, helped<br>Ps can use any method they wish to deduce the answer.<br>In unison<br>T could have statements written on BB or SB or OHT to make discussion easier.<br>Discussion, reasoning, agreement, self-correcting, praising<br>Extra praise if Ps used reasoning, not calculation, to work out the correct answer. |
| | *30 min* | |
| **7** | ***PbY3b, page 101***<br>Q.3 Read: *Write down the data. Make a plan. Estimate, calculate and check the answer.*<br>Deal with one part at a time. Ps read problem themselves and solve it. Review at BB with whole class. (Ps can show solutions on scrap paper or 'slates' on command.)<br>Ps explain method of solution and discuss and correct mistakes.<br>a) *There are 857 fruit trees in an orchard. 614 are apple trees and the rest are plum trees. How many plum trees are in the orchard?*<br>*Data:* T: 857, A: 614.<br>*Plan*: P: T – A = 857 – 614<br>*Estimation*: 857 – 614 ≈ 860 – 610 = 250<br>*Answer*: There are 243 plum trees in the orchard.<br>b) *Mary and Jane are collecting buttons. Mary has 857 buttons. Jane has 641 fewer buttons than Mary. How many buttons does Jane have?*<br>*Data:* M: 857, J: M – 641 (or $J \underset{641}{<} M$)<br>*Plan*: J: 857 – 641<br>*Estimation*: 857 – 641 ≈ 860 – 640 = 220<br>*Answer*: Jane has 216 buttons. | Individual work, monitored, helped<br>T reminds Ps to use initial letters for names to save time.<br>In unison<br>Discussion, reasoning, checking, agreement, self-correcting, praising<br>*Calculation* / *Check*<br>857 − 614 = 243 (Check: 243 + 614 = 857)<br>243 ≈ 250<br>Check by comparing with estimate and then by doing addition,<br>*Calculation* / *Check*<br>857 − 641 = 216 (Check: 216 + 641 = 857)<br>216 ≈ 220 |
| | *37 min* | |

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# Y3

*Lesson Plan 101*

| *Activity* | | *Notes* |
|---|---|---|
| **8** | ***PbY3b, page 97*** | |
| | Q.4 a) Read: *Alan and Barry have 945 stamps altogether. Complete the table to show how many stamps they could each have.* | Individual work, monitored, helped |
| | Let's see how many columns you can complete in 2 minutes! | Table drawn on BB or use enlarged copy master or OHP |
| | Ps do any calculations in *Ex. Bks*. then write the missing numbers in *Pbs*. | Differentiation by time limit |
| | Review at BB with whole class. Ps come to BB or dictate to T, explaining their reasoning. Class agrees/disagrees. Mistakes discussed and corrected. | Reasoning, agreement, self-correcting, praising |
| | **X**, come and write the rule in a mathematical way. Who agrees? Who can think of another way? etc. | Whole class discussion on the rule. Involve several Ps. |
| | *Solution:* | Agreement, praising |

| *A* | **321** | 430 | **238** | 536 | **372** | 264 | **537** | 222 | **73** | 27 |
|---|---|---|---|---|---|---|---|---|---|---|
| *B* | 624 | **515** | 707 | **409** | 573 | **681** | 408 | **723** | 872 | **918** |

$A = 945 - B$ $\quad B = 945 - A$ $\quad A + B = 945$

| **Extension** | How many stamps would Barry have if Alan had 946 stamps? (– 1 mathematically but not possible in real life!) | Discussion, agreement In good humour! |
|---|---|---|
| | b) Read: *Cindy and Diana are collecting 1 p coins. Cindy has 345 more coins than Diana. Complete the table to show how many coins they could each have.* | Individual work, monitored, helped |
| | Again, set a time limit. Ps do any calculations in *Ex. Bks*. then write the missing numbers in *Pbs*. | Table drawn on BB or use enlarged copy master or OHP |
| | Review at BB with whole class. Ps come to BB or dictate to T, explain their reasoning. Class agrees/disagrees. Mistakes discussed and corrected. | Differentiation by time limit |
| | **Y**, come and write the rule in a mathematical way. Who agrees? Who can think of another way? etc. | Reasoning, agreement, self-correcting, praising |
| | *Solution:* | Whole class discussion on the rule. Involve several Ps. |

| *C* | **756** | 468 | **876** | 754 | **909** | 662 | **1058** | 1068 | **1567** | 1628 |
|---|---|---|---|---|---|---|---|---|---|---|
| *D* | 411 | **123** | 531 | **409** | 564 | **317** | 713 | **723** | 1222 | **1283** |

$C = D + 345$ $\quad D = C - 345$ $\quad C - D = 345$

| **Extension** | How much money could they each have collected? | At speed orally round class |
|---|---|---|
| | • T (or a P) points to a number in the table and Ps say it in £s and p, e.g. 468 p = £4 68 p. | Class points out errors. |
| | • T (or a P) points to a number in the table and Ps say it in £s, e.g. 564 p = £5.64 ('five point six four pounds'), Elicit that, e.g. £5.64 = £5 + 64 hundredths of a £. | Praising, encouragement only |

*45 min*

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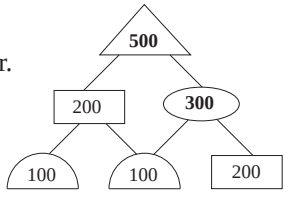
# Y3

R: Mental calculation

**C: Problems in context: addition and subtraction**

*E: Numbers up to 2000*

## *Lesson Plan* *102*

| *Activity* | | *Notes* |
|---|---|---|
| **1** | **Sequences competition**<br>a) I will describe a sequence and I will give you 1 minute to continue it as far as you can in your *Ex. Bks.*<br>The first term is 217 and it is decreasing by 16. Start . . . now! . . . Stop! Everyone stand up. Ps say terms in order round class.<br>(217, 201, 185, 169, 153, 137, 121, 105, 89, 73, 57, 41, 25, 9, – 7, – 23, . . .)<br>Ps left standing are the winners. Let's give them a round of applause!<br>b) T says first 3 terms of a sequence. Ps continue it. What is the rule?<br>128, 142, 156, (170, 184, 198, 212, 226, 240, 254, 268, . . .)<br>*Rule:* Increasing by 14 (+14) | Individual work in *Ex. Bks.*<br>Keep to time limit<br>At speed<br>Ps sit down if they have made a mistake or reached the end of their written terms.<br>Whole class activity<br>At speed round class<br>If a P makes a mistake, next P corrects it. Praising |
| | *5 min* | |
| **2** | **Problems**<br>Listen carefully, think how you can solve the problem and write a plan in your *Ex. Bks*. Choosing the correct operation is more important but you may do the calculation too if you have time.<br>a) *A family went on a 2-day trip. They spent £345 on the 1st day. On the second day they spent £169 less. How much did they spend on the second day?*<br>**A**, what is your plan? Who wrote the same? Who did it another way? etc. Who did the calculation? (If so, P explains answer, otherwise T does calculation quickly on the BB (or dictated by Ps).<br>BB: *Plan*: £345 – £169 or £(345 – 169) (= £176)<br>What other question could we ask about this problem? (How much money did the family spend altogether?) (£345 + £176)<br>b) *A school football team reached the final. The match was watched by 314 boys and 96 fewer girls. How many girls were at the match?*<br>**B**, what is your plan? Who wrote the same? Who did it another way? etc. Who did the calculation? (If so, P explains answer, otherwise T does calculation quickly on the BB (or dictated by Ps).<br>BB: *Plan*: G: 314 – 96 (= 218)<br>What other question could we ask about this problem? (How many boys and girls watched the match altogether?) (314 + 218)<br>c) *In a cinema, there were 314 children. If 96 of them were girls, how many boys were there?*<br>**C,** what is your plan? Who wrote the same? Who did it another way? etc. Elicit that the calculation is the same as for b).<br>BB: *Plan*: B: 314 – 96 (= 218)<br>What other question could we ask about this problem? (How many more boys than girls were at the cinema?) (218 – 96) | Individual work, monitored<br>Deal with one problem at a time.<br>T repeats slowly<br>Set a short time limit<br>Quick discussion, agreement, self-correction, praising<br>N.B. Aim of activity is for Ps to write the correct operation.<br>Discussion, agreement on correct operation, praising<br>T repeats slowly<br>Set a short time limit<br>Quick discussion, agreement, self-correction, praising<br>Discussion, agreement on correct operation, praising<br>T repeats slowly<br>Set a short time limit<br>Quick discussion, agreement, self-correction, praising<br>Discussion, agreement on correct operation, praising |
| | *11 min* | |
| **3** | **Puzzle 1**<br>The same shape stands for the same number.<br>The number in each shape is the sum of the two numbers directly below it.<br>What are the missing numbers?<br>  <br> | Whole class activity<br>Drawn on BB or use enlarged copy master or OHP<br>Ps come to BB to write/explain. Class agrees/disagrees.<br>At a good pace. Praising |
| | *14 min* | |

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# Y3

*Lesson Plan 102*

| *Activity* | | *Notes* |
|---|---|---|
| **4** | **Puzzle 2**<br>Write in the missing numbers and signs so that the equations are correct horizontally and vertically.<br>Ps come to BB to write and explain reasoning. Class agrees/disagrees.<br>BB: | Whole class activity<br>Drawn on BB or use enlarged copy master or OHP<br>At a good pace. Agreement, praising. **Bold** numbers given<br>Feedback for T |

| | | | | |
|---|---|---|---|---|
| **555** | | **444** | = | **999** |
| – | | – | | – |
| 333 | + | **111** | = | 444 |
| = | | = | | = |
| **222** | + | 333 | = | **555** |

*20 min*

| | | |
|---|---|---|
| **5** | **Making subtractions**<br>Listen carefully and write possible subtractions in your *Ex. Bks.*<br>*What can the difference be if you subtract from 1001:*<br>*a) a 3-digit number less than 110,*<br>*b) a 2-digit number more than 96,*<br>*c) a 3-digit number more than 995?*<br>Deal with one part at a time. Review at BB with the whole class. T writes what Ps dictate (or Ps come to BB). Class agrees/dsagrees.<br>Elicit that only the first subtraction in each part needs to be calculated as other differences can be obtained by adding on (subtracting) 1U.<br>In c), agree that 005 = 5, 004 = 4, etc. so leading zeros are not needed, but a zero after or between numbers are very important!<br>T chooses 1 or 2 subtractions for Ps (with T's help) or T to explain in detail in a place-value table. e.g. | Individual work in writing subtractions<br>BB: 1001 –<br>T repeats slowly<br>Reasoning, agreement, praising<br>BB:<br>a) 1001 − 109 = 892; 1001 − 108 = 893; … ; 1001 − 100 = 901<br>b) 1001 − 97 = 904; 1001 − 98 = 903; 1001 − 99 = 902<br>c) 1001 − 996 = ~~005~~; 1001 − 997 = ~~004~~; 1001 − 998 = ~~003~~; 1001 − 999 = ~~002~~ |

| | Th | H | T | U |
|---|---|---|---|---|
| | 1 | 0 | 0 (+10) | 1 (+10) |
| – | | 1 (+1) | 0 (+1) | 9 |
| | | 8 | 9 | 2 |

*25 min*

| | | |
|---|---|---|
| **6** | ***PbY3b, page 102***<br>Q.1 Read: *Write down the data. Make a plan. Estimate, calculate and check the answer.*<br>Ps read problems themselves and solve them. Set a time limit.<br>Review at BB with whole class. (Ps can show solutions on scrap paper or 'slates' on command.)<br>Ps explain method of solution and discuss and correct mistakes.<br>a) *A large barrel can hold 578 litres and a small barrel can hold 256 litres. How much more liquid can the large barrel hold than the small one?*<br>*Data:* L: 578 litres, S: 256 litres<br>*Plan*: L – S = (578 – 256) litres<br>*Estimation*: 578 – 256 ≈ 580 – 260 = 320 (litres)<br>*Answer*: The large barrel holds 322 litres more.<br>b) *The length of Molly's bedroom is 4 m 32 cm, which is 1 m 27 cm more than its width.*<br>*What is the width of Molly's bedroom?*<br>Ps change units to cm (or calculate horizontally in m and cm).<br>*Data:* L: 4 m 32 cm = 432 cm, W: L – 1 m 27 cm (127 cm)<br>*Plan*: W: 432 cm – 127 cm (or 4 m 32 cm – 1 m 27 cm)<br>*Estimation*: (432 – 127 ≈ 430 – 130 = 300) cm<br>*Answer*: The width of Molly's bedroom is 3 m 5 cm. | Individual work, monitored, helped<br>Differentiation by time limit<br>In unison<br>Discussion, reasoning, checking, agreement, self-correcting, praising |

| *Calculation* | | | | *Check* | | | |
|---|---|---|---|---|---|---|---|
| | 5 | 7 | 8 | | 3 | 2 | 2 |
| – | 2 | 5 | 6 | + | 2 | 5 | 6 |
| | 3 | 2 | 2 | | 5 | 7 | 8 |

320 ≈ 322

Check by comparing with estimate, then by addition.

| *Calculation* | | | | *Check* | | | |
|---|---|---|---|---|---|---|---|
| | 4 | 3 | 2 | | 3 | 0 | 5 |
| – | 1 | 2 | 7 | + | 1 | 2 | 7 |
| | 3 | 0 | 5 | | 4 | 3 | 2 |

300 ≈ 305

BB: 305 cm = 3 m 5 cm

*32 min*

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# Y3

*Lesson Plan 102*

| *Activity* | | *Notes* |
|---|---|---|
| **7** | ***PbY3b, page 102***<br>Q.2 Read: *What number is:*<br>*a) the difference between 677 and 352?*<br>*b) 352 more than 677?*<br>*c) 352 less than 677?*<br>*d) the sum of 677 and 352?*<br>Deal with one part at a time. Review at BB with whole class. Elicit that a) is the same as c) and b) is the same as d).<br>Ps explain reasoning (using vertical or horizontal calculations). Mistakes discussed and corrected.<br>*36 min* | Individual work (monitored, helped)<br>Discussion, reasoning, agreement, self-correction, praising<br>*Solution:*<br>a) $\begin{array}{r} 677 \\ -\ 352 \\ \hline 325 \end{array}$ b) $\begin{array}{r} {\scriptstyle 1}\\ 677 \\ +\ 352 \\ \hline 1029 \end{array}$<br>c) 325 d) 1029 |
| **8** | ***PbY3b, page 102, Q.3***<br>Read: *There were 236 women, 347 men, 163 boys and 148 girls on a beach.*<br>Deal with one part at a time. Ps discuss what data and operations are needed to answer the questions. P comes to BB to do calculations, explaining reasoning. Class checks that they are correct (e.g. mental estimation or reverse addition). Ps say answer to question as a sentence in unison.<br>*a) How many people were on the beach altogether?* BB: $\begin{array}{r} {\scriptstyle 1\ 1}\\ 236 \\ 347 \\ 163 \\ +\ 148 \\ \hline 894 \end{array}$<br>*Answer:* There were 894 people on the beach.<br>*b) How many of them were adults?* BB: $\begin{array}{r} {\scriptstyle 1}\\ 236 \\ +\ 347 \\ \hline 583 \end{array}$<br>*Answer:* 583 of them were adults.<br>*c) How many more adults than children were there?* BB: No. of children: $\begin{array}{r} {\scriptstyle 1\ 1}\\ 163 \\ +\ 148 \\ \hline 311 \end{array}$ $\begin{array}{r} 583 \\ -\ 311 \\ \hline 272 \end{array}$<br>*Answer:* There were 272 more adults than children.<br>*d) i) Were there more males or females on the beach?* BB: No. of males: $\begin{array}{r} {\scriptstyle 1\ 1}\\ 347 \\ +\ 163 \\ \hline 510 \end{array}$ > No. of females: $\begin{array}{r} {\scriptstyle 1}\\ 236 \\ +\ 148 \\ \hline 384 \end{array}$<br>*Answer:* There were more males on the beach.<br>*ii) How many more?* BB: $\begin{array}{r} 510 \\ -\ 384 \\ \hline 126 \end{array}$ M > F 126<br>*Answer:* There were 126 more males on the beach.<br>*41 min* | Whole class activity<br>(or individual work in *Ex. Bks*, monitored, with answers shown on scrap paper or 'slates' on command)<br>Discussion, reasoning, agreement, praising<br>In unison<br>Discussion, reasoning, agreement, praising<br>In unison<br>Discussion, reasoning, agreement, praising<br>In unison<br>Discussion, reasoning, agreement, praising<br>In unison<br>Discussion, reasoning, agreement, praising<br>In unison |

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# Y3

*Lesson Plan 102*

| ***Activity*** | | ***Notes*** |
|---|---|---|
| **9** | ***PbY3b, page 102***<br>Q.4 Read: *Complete the subtractions.*<br>Let's see how many of these you can do in 2 minutes! Use any method you wish to find the missing number.<br>Review at BB with whole class. Ps explain how they did the calculations. Who did the same? Who did it another way? etc. How can we check it? (Ps suggest ways)<br>Accept any valid reasoning, e.g. in:<br>b) 48 + what makes 52? (4), 200 + what makes 900? (700), so missing number is 700 + 4 = 704.<br>c) add bottom 2 numbers (difference and subtrahend) to get the top one (reductant).<br>e) 1764 – 246 = 1564 – 40 – 6 = 1524 – 6 = 1518;<br>or 64 minus what is 46? (18), 17H minus what is 2H? (15H), so missing number is 18 + 1500 = 1518<br>Mistakes discussed and corrected<br>(Or done as a whole class activity if T prefers.)<br>*45 min* | Individual work, monitored, helped<br>Written on BB or use enlarged copy master or OHP<br>Differentiation by time limit<br>Discussion, reasoning, checking, agreement, self-correction, praising<br>*Solution:*<br>a) 876 – 154 = **722**<br>b) 952 – **704** = 248<br>c) **969** – 456 = 513<br>d) 859 – 327 = **532**<br>e) 1764 – **1518** = 246 |

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# Y3

R: Mental calculation
**C: Addition and subtraction**
*E: Numbers up to 2000*

## *Lesson Plan* *103*

| *Activity* | | *Notes* |
|---|---|---|
| **1** | **Competition**<br>T divides class into 3 or 4 teams (of roughly equal ability). Each team writes on different parts of the BB (or on SB, flip chart, or large sheets of paper stuck to the wall, unseen by the other teams).<br>I will give you 2 minutes to write the number 725 in as many different ways as you can. You must start and stop when I say.<br>Start ... now! Ps from each team come out one after another to write different descriptions. Rest of team correct their team-mates' errors, point out repetitions and suggest ideas. . . . Stop!<br>Review each team's descriptions. The team with the most correct statements (and fewest wrong ones) is the winner.<br>*5 min* | Whole class activity<br>At a good pace<br>e.g. 725<br>420 + 305<br>1000 – 275<br>145 × 5<br>7H + 2T + 5U<br>1450 ÷ 2<br>7 × 100 + 5 × 5<br>etc.<br>Class applauds the winners |
| **2** | **Subtraction practice**<br>If possible, T has drawings or pictures of squirrels and acorns on BB.<br>*Ginny* and *Minny Mouse* have collected 1534 acorns altogether to put in their store for the winter. How many acorns could they each have collected? Let's complete the table.<br>Ps come to BB to choose a column and fill in the missing numbers, explaining reasoning. Class checks that they are correct.<br>Who can write the rule? Who agrees? Who can write it another way? etc.<br>BB:<br>$G$ \| **521** \| 1121 \| **920** \| 709 \| **689** \| 766 \| **767**<br>$M$ \| 1013 \| **413** \| 614 \| **825** \| 845 \| **768** \| 767<br>$G = 1534 - M, \quad M = 1534 - G, \quad G + M = 1534$<br>*10 min* | Whole class activity<br>BB: **1534** <br>At a good pace<br>Ps can do calculations in *Ex. Bks*. if they wish.<br>Reasoning, checking, agreement, praising<br>Show problem calculations in detail, e.g.<br>BB: $\begin{array}{r} {}^{2}\not{1}\,{}^{10}\not{5}\not{3}4 \\ -\ 825 \\ \hline 709 \end{array}$ or $\begin{array}{r} 1534 \\ -\ 82\,{}^{1}5 \\ \hline 709 \end{array}$ |
| **3** | **Problems**<br>Listen carefully and think how you can solve the problem. You can do the calculation in your head or in your *Ex. Bks*. Sit up with your arms folded when you are ready. Show me the answer when I say.<br>a) *Mum made 123 sandwiches for a birthday party. After the party, 39 sandwiches were left. How many sandwiches had been eaten?*<br>Show me your answer . . . now! (84)<br>**A**, explain to us how you worked out the answer. Who did the same? Who did it another way? etc. Discuss all mistakes.<br>e.g. 123 – 39 = 123 – 40 + 1 = 83 + 1 = 84, or<br>123 – 39 = 123 – 30 – 9 = 93 – 9 = 84. or $\begin{array}{r} 123 \\ -\ 39 \\ \hline 84 \end{array}$<br>*Answer:* 84 sandwiches had been eaten.<br>b) *There were 39 sandwiches left after a party. If 123 sandwiches had been eaten, how many sandwiches did Mum make for the party?*<br>Show me your answer . . . now! (162)<br>**B**, explain to us how you worked out the answer. Who did the same? Who did it another way? etc. Discuss all mistakes.<br>e.g. 123 + 39 = 123 + 40 – 1 = 122 + 40 = 162, or<br>123 + 39 = 123 + 30 + 9 = 153 + 9 = 162, or $\begin{array}{r} 123 \\ +\ 39 \\ \hline 162 \end{array}$<br>*Answer:* Mum made 162 sandwiches for the party.<br>*15 min* | Whole class activity<br>Answers written on scrap paper or on 'slates'<br>T repeats slowly<br>In unison<br>Reasoning, agreement, praising<br>T chooses a P to say the answer in a sentence.<br>T repeats slowly<br>In unison<br>Reasoning, agreement, praising<br>Class says the answer as a sentence in unison. |

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# Y3

*Lesson Plan 103*

| *Activity* | | *Notes* |
|---|---|---|
| **4** | **Written exercises**<br>T dictates operations. Ps copy into *Ex. Bks* and do the calculations.<br>a) $80 \times 5 - 128 = (400 - 128 = 300 - 28 = 280 - 8 = \underline{272})$<br>b) $200 \div 5 + 136 = (40 + 136 = \underline{176})$<br>c) $50 \times 7 + 61 \times 3 = (350 + 183 = 450 + 83 = 500 + 33 = \underline{533})$<br>Review at BB with whole class. Ps explain how they did the calculations. Deal with all cases. Mistakes discussed and corrected.<br>*20 min* | Individual work, monitored (helped)<br>T has questions already written on BB (SB or OHT)<br>Discussion, agreement, self-correcting, praising<br>or a) $\begin{array}{r} 400 \\ -\,128 \\ \hline 272 \end{array}$ c) $\begin{array}{r} 350 \\ +\,183 \\ \hline 533 \end{array}$ |
| **5** | **Making plans**<br>Listen carefully, think how you would solve the problem and write only the calculation on your 'slates' (or in your *Ex. Bks.* first). You do not need to work out the answer.<br>a) *In a school, there are 288 girls and 155 boys. How many pupils are in the school?*<br>Show me the calculation . . . now! (228 + 155) (= 383)<br>Ps who responded correctly explain to those who did not.<br>b) *There are 228 pupils in a school. 155 of them are girls. How many of them are boys?*<br>Show me the calculation . . . now! (228 – 155) (= 73)<br>Ps who responded correctly explain to those who did not.<br>c) *In a school, there are 228 girls, 155 more than the number of boys. How many boys are in the school?*<br>Show me the calculation . . . now! (228 – 155) (= 73)<br>Ps who responded incorrectly work through it on BB with help of class. Elicit that c) means the same as b) but is worded differently.<br>*25 min* | Whole class activity<br>T repeats slowly<br>In unison<br>Reasoning, agreement<br>T repeats slowly<br>In unison<br>Reasoning, agreement<br>T repeats slowly<br>In unison<br>Reasoning, agreement<br>Praising. Feedback for T |
| **6** | ***PbY3b, page103***<br>Q.1 Read: *Complete the additions. Write a subtraction for each one.*<br>Set a time limit. Review at BB with whole class. Ps come to BB or dictate to T. Ps explain reasoning. Mistakes corrected. Agree that the subtractions are checks for the additions.<br>*Solution:*<br>a) $\begin{array}{r} \mathbf{4\,5\,5} \\ +\;1\,4\,2 \\ \hline 5\,9\,7 \end{array}$ $\begin{array}{r} 5\,9\,7 \\ -\;1\,4\,2 \\ \hline 4\,5\,5 \end{array}$<br>b) $\begin{array}{r} \mathbf{3\,7\,3} \\ +\;3\,0\,5 \\ \hline 6\,7\,8 \end{array}$ $\begin{array}{r} 6\,7\,8 \\ -\;3\,0\,5 \\ \hline 3\,7\,3 \end{array}$<br>c) $\begin{array}{r} \mathbf{5\,5\,4} \\ +\;1\,3\,2\,5 \\ \hline 1\,8\,7\,9 \end{array}$ $\begin{array}{r} 1\,8\,7\,9 \\ -\;1\,3\,2\,5 \\ \hline 5\,5\,4 \end{array}$<br>d) $\begin{array}{r} 1\,3\,5\,6 \\ +\;\mathbf{2\,5\,0} \\ \hline 1\,6\,0\,6 \end{array}$ $\begin{array}{r} 1\,6\,0\,6 \\ -\;2\,5\,0 \\ \hline 1\,3\,5\,6 \end{array}$<br>e) $\begin{array}{r} \mathbf{5\,5\,3} \\ +\;4\,6\,\mathbf{0} \\ \hline \mathbf{1}\,0\,\mathbf{1}\,3 \end{array}$ $\begin{array}{r} 1\,0\,1\,3 \\ -\;4\,6\,0 \\ \hline 5\,5\,3 \end{array}$<br>*31 min* | Individual work, monitored<br>Differentiation by time limit<br>(Do part e) with the whole class if necessary.)<br>Written on BB or use enlarged copy master or OHP<br>Discussion, reasoning, agreement, self-correcting, praising<br>T chooses 1 or 2 subtractions for Ps to explain in detail (by adding or transferring 10s). |

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# Y3

*Lesson Plan 103*

| *Activity* | | *Notes* |
|---|---|---|
| **7** | ***PbY3b, page103***<br>Q.2 Read: *Complete the subtractions. Write the differences in increasing order.*<br>Ps can use either method of subtraction (adding or transferring tens), or T can decide which method Ps should use. Ps check work by mental addition.<br>Review at BB with whole class. Ps come to BB or dictate to T, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected.<br>*Solution:*<br>a) 673 − 321 = **352**; b) 496 − 272 = **224**; c) 893 − 628 = **265**; d) 541 − 352 = **189**<br>BB: 189 < 224 < 265 < 352<br>*36 min* | Individual work, monitored, helped<br>Written on BB or use enlarged copy master or OHP<br>Discussion, reasoning, checking, agreement, self-correcting, praising<br>*Check:* + ↑<br>Ps dictate to T. Praising |
| **8** | ***PbY3b, page103***<br>Q.3 Read: *Solve the problem in your exercise book. Check your result. Write the answer.*<br>Ps read problem themselves, write the data, make a plan, do the calculations in their *Ex. Bks*, check the result and then write the answer as a sentence in their *Pbs.*<br>*On Monday, the children picked 253 apples in their grandparent's orchard.*<br>*On Tuesday they picked 89 more apples than they did on Monday. How many apples did the children pick altogether?*<br>Review at BB with whole class. **D**, read us your answer. **D**, come and explain what you did. Who did the same? Who got the same answer in another way? Who got a different answer? etc.<br>*Solution:*<br>*Data:* M: 253 apples, T: (M + 89) apples or T $\overset{89}{>}$ M<br>*Plan*: M + T: 253 + 253 + 89 *E*: 250 + 250 + 90 = 590<br>*C*: T: 253 + 89 = 342; M + T: 253 + 342 = 595 or M + T: 253 + 253 + 89 = 595<br>*Answer*: They picked 595 apples altogether.<br>*40 min* | Individual work, monitored, helped<br>If necessary, T could keep class together for each step.<br>(T o save time, T could have solution already prepared on BB or SB or OHT and uncover each step as it is dealt with.)<br>Discussion, reasoning, checking, agreement, self-correcting, praising<br>Ps check by comparing with estimation and by doing addition in opposite direction.<br>or 2 × 253 + 89 = 400 + 100 + 6 + 89 = 500 + 95 = 595 |

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# Y3

*Lesson Plan 103*

| ***Activity*** | | ***Notes*** |
|---|---|---|
| **9** | ***PbY3b, page103,* Q.4**<br>T explains task. T shows a dice, elicits possible digits and writes them on the BB: 1, 2, 3, 4, 5, 6<br>Make sure that Ps know that only one of each of these digits can be used in the reductant and subtrahend, but any digit can be repeated in the difference.)<br>Deal with one part at a time. Discuss strategies for solution. e.g.<br>a) *at least 300* (H digits must have a difference of 3 or more)<br>b) *the smallest possible* (the two closest 3-digit numbers)<br>c) *between 200 and 300* (Hundreds digits must have a difference of 2)<br>d) *even* (both Units digits must be odd or both must be even)<br>e) t*he greatest possible* (biggest possible number – smallest possible)<br>f) *divisible by 10* (Units digit must be 0, but 0 is not shown on a dice, so the question is impossible!)<br>Ps dictate to T or come to BB. (Or pairs of Ps could work on each part at the same time.)<br>*Solution:*<br>a) at least 300<br>e.g. 654 − 231 = 423<br>b) the smallest possible<br>412 − 365 = □47<br>c) between 200 and 300<br>e.g. 653 − 412 = 241<br>d) even<br>e.g. 465 − 321 = 144<br>e) the greatest possible<br>654 − 123 = 531<br>f) divisible by 10<br>□□□ − □□□ = □□□<br>Impossible!<br>*45 min* | Whole class activity<br>(Or individual trial if Ps wish)<br>Grids drawn on BB or use enlarged copy master or OHP<br>Discussion, agreement, praising<br>Other Ps could try them out in *Pbs* too.<br>Discussion, reasoning, agreement, praising<br>Extra praise if Ps find the solution to part b) without help.<br>If not enough time, Ps could finish it at home if they wish. |

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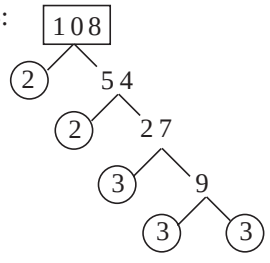
# Y3

R: Mental calculation
**C: Equations. Puzzles. Four operations**
*E: Challenges*

## *Lesson Plan* *104*

| *Activity* | | *Notes* |
|---|---|---|
| **1** | **Ordering numbers**<br>a) Let's put the fruit in order so that the numbers are decreasing.<br>BB: <br>Ps come to BB to rearrange the fruit or to write the numbers in order.<br>BB: 963 > 758 > 632 > 419 > 347<br>b) In your *Ex. Bks*, calculate the difference between each adjacent number. Ps come to BB to write subtractions or dictate to T what to write. Class agrees/disagrees.<br>BB: $\begin{array}{r} 963 \\ -\,758 \\ \hline 205 \end{array}$ $\begin{array}{r} 758 \\ -\,632 \\ \hline 126 \end{array}$ $\begin{array}{r} 632 \\ -\,419 \\ \hline 213 \end{array}$ $\begin{array}{r} 419 \\ -\,347 \\ \hline 72 \end{array}$<br>c) How many more is, e.g.<br>• the 1st number on the left than the 2nd number from the right?<br>• the greatest number than the smallest number? etc.<br>(or Ps could choose the numbers.)<br>*8 min* | Whole class activity<br>Use enlarged copy master, enlarged, coloured and fruit cut out and stuck at random on BB<br>Agreement, praising<br>Individual work, monitored<br>Encourage quick work<br>Reasoning, agreement, praising.<br>BB: e.g. $\begin{array}{r} 963 \\ -\,632 \\ \hline 331 \end{array}$ $\begin{array}{r} 963 \\ -\,347 \\ \hline 616 \end{array}$ |
| **2** | **Written exercises**<br>Listen carefully and do the calculation in your head or in your *Ex. Bks.* Show me the result when I say.<br>a) i) *108 is 2 times which number?* Show me . . . now! (54)<br>(BB: 108 ÷ 2 = 100 ÷ 2 + 8 ÷ 2 = 50 + 4 = 54)<br>ii) *108 is half of which number?* Show me . . . now! (216)<br>(BB: 108 × 2 = 100 × 2 + 8 × 2 = 200 + 16 = 216)<br>b) i) *108 is 3 times which number?* Show me . . . now! (36)<br>(BB: 108 ÷ 3 = 90 ÷ 3 + 18 ÷ 3 = 30 + 6 = 36)<br>ii) *108 is 1 third of which number?* Show me . . . now! (324)<br>(BB: 108 × 3 = 100 × 3 + 8 × 3 = 300 + 24 = 324)<br>c) i) *108 is 4 times which number?* Show me . . . now! (27)<br>(BB: 108 ÷ 4 = 80 ÷ 4 + 28 ÷ 4 = 20 + 7 = 27)<br>ii) *108 is 1 quarter of which number?* Show me . . . now! (432)<br>(BB: 108 × 4 = 100 × 4 + 8 × 4 = 400 + 32 = 432)<br>Ps who responded correctly explain their reasoning (writing relevant equations on BB) to those who did not. | Whole class activity<br>Responses written on scrap paper or on 'slates'<br>In unison<br>Reasoning, agreement, praising<br>Or Ps might reason with addition, e.g. $\begin{array}{r} 108 \\ +\,108 \\ \hline 216 \end{array}$ $\begin{array}{r} 108 \\ +\,108 \\ \hline 324 \end{array}$ |
| **Extension**<br>See *Y2 LP 122/8* | Here is another way we could have used. T revises what the factors of a number are. Who remembers how to break a number down into its lowest factors? T might need to start off to stir Ps' memories.<br>As 108 is an even number, what must the lowest factor be? (2)<br>2 times what equals 108? (54) T writes 2nd line in diagram. Does 2 have any factors other than itself and 1? (No) So we circle '2'.<br>What is the lowest factor of 54? (even number, so must be 2) 2 times what equals 54? (27). Continue in this way until all the factors have been circled. Then relate these to the questions above.<br>a) 2 × ( 2 × 3 × 3 × 3) b) 3 × (2 × 2 × 3 × 3)<br>c) (2 × 2) × (3 × 3 × 3)<br>*14 min* | Discussion, explanation, demonstration, agreement<br>BB:  <br>108 = 2 × 2 × 3 × 3 × 3 |

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# Y3

*Lesson Plan 104*

| *Activity* | | *Notes* |
|---|---|---|
| **3** | **Time problem**<br>Listen carefully. If you think the statement is true, stand up and if it is false clap your hands when I say.<br>*Eve sunbathed for 3 quarters of an hour and swam for 1 quarter of an hour. She said that she was on the beach for 1 hour. Is Eve correct?*<br>Show me . . . now! (correct)<br>Who can come and write an equation about it? Who agrees? etc.<br>BB: 3 quarters of an hour + 1 quarter of an hour = 1 hour<br>Let's write it in minutes too. Elicit that:<br>BB: 1 hour = 60 minutes<br>1 quarter of an hour = 15 minutes<br>3 quarters of an hour = 15 min. × 3 = 45 min.<br>Who can write the equation about Eve in minutes?<br>BB: 45 minutes + 15 minutes = 60 minutes (= 1 hour) | Whole class activity<br>Or other agreed actions<br>T repeats slowly<br>In unison<br>Agreement, praising<br>Discussion, agreement, praising<br>Show on real clock if possible or draw on BB<br>P come to BB or dictate to T<br>Agreement, praising |
| **Extension** | T (or Ps) think of other similar questions to review fractions of time. | Praise creative contexts |
| | *18 min* | |
| **4** | **Missing numbers**<br>What numbers could we write in the boxes to make the equations correct?<br>Deal with one part at a time. Ps suggest where to start and what to do next. Ps come to BB to do calculations and fill in missing numbers. Class points out errors or suggests alternative methods of solution.<br>BB:<br>a) $\underbrace{86 \times 2}_{172} + 128 = \underbrace{120 \times 3}_{360} - \boxed{60}$ (300 = 360 – 60)<br>b) $\underbrace{200 \times 5}_{1000} - 136 = \underbrace{800 \div 4}_{200} + \boxed{664}$<br>c) $\underbrace{50 \times 7}_{350} + 319 = \underbrace{600 \times 2}_{1200} - \boxed{531}$<br>$\begin{array}{r} 172 \\ +128 \\ \hline 300 \end{array}$ $\begin{array}{r} 1000 \\ -136 \\ \hline 864 \end{array}$ $\begin{array}{r} 864 \\ -200 \\ \hline 664 \end{array}$ $\begin{array}{r} 350 \\ +319 \\ \hline 669 \end{array}$ $\begin{array}{r} 1200 \\ -669 \\ \hline 531 \end{array}$ | Whole class activity<br>T has BB or SB or OHT already prepared<br>Discussion, reasoning, checking, agreement, praising<br>Encourage Ps to say what they are doing loudly and clearly.<br>Addition/subtraction can be done mentally or written on BB horizontally or vertically<br>Feedback for T |
| | *23 min* | |
| **5** | **Puzzle**<br>The same symbol means the same number. Each number is the sum of the two numbers directly below it. Let's fill in the missing numbers.<br>BB:<br>**1000**<br>❑ 400 ❖ 600<br>▲ 200 ▲ 200 ❑ 400<br>Ps come to BB to write a number, explaining reasoning. Class agrees/ disagrees. (Ps might notice the similarity to the puzzle in *LP 102/3*.) | Whole class activity<br>Drawn on BB or use enlarged copy master or OHP<br>**Bold** number is given<br>At a good pace<br>Reasoning, checking mentally, agreement, praising<br>Extra praise if a P notices. |
| | *26 min* | |

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# Y3

*Lesson Plan 104*

| *Activity* | | *Notes* |
|---|---|---|
| **6** | ***PbY3b, page 104***<br>Q.1 Read: *The sum of any two adjacent numbers is the number directly above them. The same sign means the same number. Fill in the missing numbers.*<br>Deal with one part at a time. Elicit that the rule is the same as the previous activity but written in a different way.<br>Let's see if you can solve them in 2 minutes!<br>Review quickly at BB with whole class. Mistakes corrected.<br>(Ps might notice the similarity in these 3 puzzles + *LP 102/3*.*)<br>*Solution:*<br>a) **2000** / 800, 1200 / 400, 400, 800<br>b) **900** / 360, 540 / 180, 180, 360<br>*29 min* | Individual work, monitored<br>Only help given is, 'Are you sure?'<br>Drawn on BB or use enlarged copy master or OHP<br>Differentiation by time limit<br>**Bold** numbers are given.<br>Discussion, agreement, checking, praising<br>* i.e. **1 whole**<br>2 fifths 3 fifths<br>1 fifth 1 fifth 2 fifths<br>Extra praise if a P notices. |
| **7** | ***PbY3b, page 104***<br>Q.2 Read: *Work out the rule and fill in the missing numbers.*<br>Let's see if you can solve them in 3 minutes!<br>Review at BB with whole class. What is the rule? T asks several Ps what they think and why. Ps come to BB or dictate to T, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected.<br>*Solution:*<br>a) 227, 148, 112, 87 / 79, **36**, 25 / **43**, **12** / **31**<br>b) 879, 555, 333, 121 / **324**, 222, 212 / **102**, **10** / **92**<br>*Rule:* The difference bwetween two adjacent numbers is the number directly below them. (or equivalent)<br>*34 min* | Individual work, monitored (helped)<br>Drawn on BB or use enlarged copy master or OHP<br>Differentiation by time limit<br>**Bold** numbers are missing<br>Discussion, agreement, checking, praising |
| **8** | ***PbY3b, page 104***<br>Q.3 Read: *Write your answer as an operation.*<br>T tells Ps just to write the operations. If they have time at the end, they can do the calculations in their *Ex. Bks* if they wish.<br>Read: *What number is:*<br>*a) 189 more than the sum of 372 and 476?* (372 + 476 + 189)<br>*b) 189 more than the difference between 372 and 476?* (476 – 372 + 189)<br>*c) 189 less than the sum of 372 and 476?* (372 + 476 – 189)<br>*d) 178 less than 4 times 80?* (4 × 80 – 178)<br>*e) 593 more than 1 sixth of 480?* (480 ÷ 6 + 593)<br>Review at BB with whole class. Mistakes corrected.<br>If Ps did not have time to do the calculations, they could do them in their *Ex. Bks*. in *Lesson 105* (or at home) if they want to.<br>*38 min* | Individual work, monitored, helped<br>(or whole clas activity if T prefers)<br>If Ps are able, allow them to complete all parts before reviewing, otherwise deal with one part at a time.<br>Ps dictate to T what to write, explaining reasoning.<br>Agreement, self-correction, praising<br><u>Answers to calculations</u>:<br>a) 1037 b) 293<br>c) 659 d) 142<br>f) 673 |

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# Y3

*Lesson Plan 104*

| *Activity* | | *Notes* |
|---|---|---|
| **9** | ***PbY3b, page 104***<br>Q.4 Read: *Which numbers can be written instead of the letters to make the statements true?*<br>T first shows/elicits how to write a long list of numbers in a short space. e.g.<br>BB: 21 onwards: 21, 22, . . .<br>21 to 30: 21, 22, . . ., 29, 30<br>up to 21: . . ., 20, 21<br>Deal with one part at a time. Ps can do calculations in *Ex. Bks*.<br>Review each column at BB with whole class. Ps come to BB to write possible numbers (or dictate to T) and explain reasoning. Class agrees/disagrees. Mistakes discussed and corrected.<br>If problems, show on number line (appropriate segment drawn on BB if necessary).<br>*Solution:*<br>i) $589 + \boxed{a} = 832$; $a = 243$<br>$589 + \boxed{b} > 832$; $b$ : 244, 245, 246, . . .<br>$589 + \boxed{c} \leq 832$; $c$ : 243, 242, . . .<br>ii) $645 - \boxed{d} = 331$; $d = 314$<br>$645 - \boxed{e} \geq 331$; $e$ : 314, 313, . . .<br>$645 - \boxed{f} < 331$; $f$ : 315, 316, . . ., 645<br>iii) $\boxed{g} - 375 = 412$; $g = 787$<br>$\boxed{h} - 375 < 412$; $h$ : 786, 785, . . .<br>$\boxed{i} - 375 > 412$; $i$ : 788, 789, . . .<br>*43 min* | Individual work, monitored, helped<br>(or whole class activity)<br>Give Ps the chance to explain if they can<br>Written on BB or use enlarged copy master or OHP<br>Reasoning, agreement<br>If disagreement, Ps do calculations in detail on BB<br>Ps read statements using a number chosen from correct list. Class checks that statement is true.<br>Praising, encouragement only<br>Feedback for T |
| **10** | ***PbY3b, page 104***<br>Q.5 Read: *The same letter stands for the same digit. What is the value of each letter? Write the sum with digits.*<br>Let's see if you can solve it in 2 minutes! You can discuss it with your neighbour if you wish.<br>As soon as Ps have a solution, they show it on the BB. Class agrees whether it is valid or not. If nobody solves it in the time, Ps can try it at home if they wish.<br>*Solution*: e.g. $\begin{array}{r} ONE \\ +\,FOUR \\ \hline FIVE \end{array}$ $\begin{array}{r} 189 \\ +5160 \\ \hline 5349 \end{array}$ or $\begin{array}{r} 324 \\ +1370 \\ \hline 1694 \end{array}$ etc.<br>*45 min* | Individual (or paired) work<br>(or whole class activity if T prefers)<br>Sum in letters written on BB or OHT<br>Reasoning, checking, agreement<br>Extra praise if Ps find a solution within the time without help. |

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| **Y3** | | *Lesson Plan* *105* |
|---|---|---|
| ***Activity*** | | ***Notes*** |
| | Tables practice, revision, activities, consolidation<br>*PbY3b, page 105* | |

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# Y3

R: Four operations
**C: Geometry: sorting 1–D, 2–D and 3–D shapes**
*E: Drawing shapes*

## *Lesson Plan* *106*

| *Activity* | | *Notes* |
|---|---|---|
| **1** | **Sequences**<br>Let's continue these sequences for 3 terms in each direction. Ps come out to BB to write the terms. Class agrees on the rule.<br>BB: *Rule:*<br>a) (425, 465, 505), **545, 585, 625,** (665, 705, 775) [+ 40]<br>b) (305, 355, 505), **455, 505, 555,** (605, 655, 705) [+ 50]<br>c) (1374, 1254, 1134), **1014, 894, 774,** (654, 534, 414) [– 120]<br>*5 min* | Whole class activity<br>3 **bold** terms already written on BB<br>Discussion on the rule.<br>At a good pace<br>Reasoning, agreement, praising |
| **2** | **Mental multiplication and division practice**<br>T says a multiplication or division. P says the result. e.g.<br>a) $8 \times 7$, $4 \times 9$, $6 \times 8$, $7 \times 3$, etc.; $63 \div 7$, $42 \div 6$, $25 \div 5$, etc.<br>b) $7 \times 1$, $7 \times 10$, $7 \times 100$; $18 \times 1$, $18 \times 10$, $18 \times 100$; $19 \times 10$, $10 \times 130$, $100 \times 15$, etc.;<br>c) $12 \div 2$, $120 \div 2$, $120 \div 20$; $15 \div 5$, $150 \div 5$, $150 \div 50$; $10 \div 10$, $100 \div 10$, $100 \div 100$, etc.;<br>d) $0 \times 0$, $1 \times 1$, $2 \times 2$, $3 \times 3$, $4 \times 4$, $5 \times 5$, $6 \times 6$, $7 \times 7$, $8 \times 8$, $9 \times 9$, $10 \times 10$, ($11 \times 11$, $12 \times 12$)<br>*10 min* | Whole class activity<br>T chooses Ps at random<br>If a P makes a mistake, the next P corrects it, so all Ps should concentrate all the time!<br>At speed. Praising<br>Ps explain reasoning for:<br>$11 \times 11 = 11 \times 10 + 11 = 121$<br>$12 \times 12 = 12 \times 10 + 12 \times 2 = 120 + 24 = 142$ |
| **3** | **Written exercises**<br>T dictates operations. Ps write in *Ex. Bks* and do calculations.<br>a) $130 + 12 \overset{6}{\div} 2 = (136)$ b) $712 - 40 \overset{280}{\times} 7 = (432)$<br>c) $90 \overset{450}{\times} 5 - 265 = (185)$ d) $140 \overset{20}{\div} 7 + 498 = (518)$<br>e) $380 - 60 \overset{15}{\div} 4 = (365)$ f) $(380 \overset{320}{-} 60) \div 4 = (80)$<br>g) $240 \overset{40}{\div} 6 + 2 = (42)$ h) $240 \div (6 \overset{8}{+} 2) = (30)$<br>Deal with two at a time. Ps explain how they did the calculations. (Order of operations) Mistakes discussed and corrected.<br>*15 min* | Individual work, monitored (T walks round while reading out the questions)<br>Questions and answers already prepared on BB or SB or OHT and T uncovers each one as it is reviewed.<br>Reasoning, agreement, self-correction, praising<br>Feedback for T |
| **4** | **Shapes**<br>a) T has various real objects (e.g. tin, carton, brick, ball, randomly shaped objects) and geometrical <u>solids</u> (e.g. cube, cuboid, pyramid, etc.) on desk at front of class.<br>How could we sort these things? Ps suggest various ways. (e.g. size; material; curved surface or flat (plane) faces or a mixture of the two; number of faces (edges, vertices); parallel or perpendicular edges or neither; etc.) Class discusses the various groupings. Agree that all items are 3-dimensional, i.e. have height, width and depth.<br>b) T has various <u>plane</u> shapes stuck to (or drawn on) BB. (e.g. square, rectangle, circle, triangle, pentagon, semicircle, random shapes, etc.)<br>How could we sort these shapes? Ps suggests ways. (e.g. curved or straight sides or mixed, number of sides (vertices), etc. Class discusses the various groupings. Agree that all are 2-dimensional. (width, height)<br>c) T draws various (unclosed) line patterns on BB. What kind of shapes are these? Agree that they are not solids or plane shapes but only <u>lines</u>. How could we sort them? (e.g. curved or straight or mixed; length) Agree that lines can be thought of as being 1-dimensional. (length)<br>*20 min* | Whole class activity<br>T decides on number and variety<br>Discussion, demonstration, agreement, praising<br>Encourage Ps to use correct geometrical names. BB: <u>3–D</u><br>Discussion, demonstration, agreement, praising. BB: <u>2–D</u><br>Extra praise if Ps mention perpendicular (parallel) sides, right angles, perimeter, etc.<br>Discussion, demonstration, agreement, praising. BB: <u>1–D</u><br>Feedback for T |

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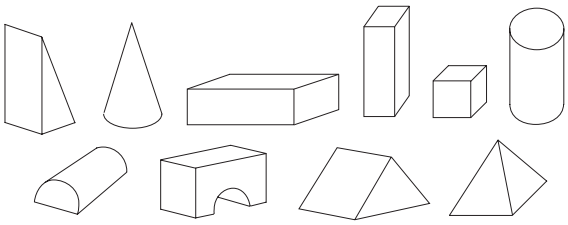
# Y3

*Lesson Plan 106*

| *Activity* | | *Notes* |
|---|---|---|
| **5** | **Building solids**<br>a) T and/or Ps have set of (wooden) building blocks on desks. e.g.<br>  <br>Ps use the elements to make different combined shapes. Ps show their shapes to class and name and describe the elements.<br>b) Ps have Cuisennaire rods or unit cubes or multi-link on desks. Ps freely construct various shapes. T chooses Ps to show their shapes to class and to describe them. Class suggests missed criteria (e.g. number of vertices, edges, faces, type of edges, faces)<br>*25 min* | Individual (or paired) work, monitored<br>If Ps do not have own building blocks, they come out to select from large models on T's desk<br>Naming/describing, agreement, praising<br>Extra praise for creative shapes or good descriptions<br>And/or paired discussion:<br>Ps describe their shapes to their neighbours who agree/disagree or suggest missed criteria, as preparation for review with whole class. |
| **6** | ***PbY3b, page 106***<br>Q.1 Read: *Count the number of faces, vertices and edges of each solid and fill in the table.*<br>If possible, T has large models on desk. Otherwise T refers to BB or OHP. Make sure that Ps know what a face (vertex, edge) is. Ps come out to point to them on the diagrams or models.<br>T explains that the dotted lines in the diagrams are edges which cannot be seen from the front, but must be included in counting.<br>Review at BB with whole class. Ps come out to fill in columns or dictate to T. Class agrees/disagrees. If disagreement, T confirms on model. Mistakes corrected.<br>When dealing with each shape, ask Ps to name the faces and to identify faces or edges which are parallel or perpendicular.<br>*Solution:* | Whole class discussion to start<br>Drawn on BB or use enlarged copy master or OHP<br>Agreement, praising<br>Individual work, monitored (helped)<br>At a good pace<br>Reasoning, checking, agreement, self-correcting, praising<br>Ps could hold their *Pbs* or 'slates' parallel (perpendicular) to their desks to reinforce the concepts if needed. |

| | Square-based pyramid | Triangle-based prism | Cuboid | Cube | Hexagonal prism | Triangle-based pyramid |
|---|---|---|---|---|---|---|
| Faces | 5 | 5 | 6 | 6 | 8 | 4 |
| Vertices | 5 | 6 | 8 | 8 | 12 | 4 |
| Edges | 8 | 9 | 12 | 12 | 18 | 6 |

| | | |
|---|---|---|
| **Extension** | Who could write a rule for the table? Who agrees? Who could write it in another way? etc.<br>BB: $E = F + V - 2$, $F = E - V + 2$, $V = E - F + 2$<br>$(F + V = E + 2)$<br>*30 min* | Whole class activity<br>Reasoning, agreement, checking with values from table<br>Praising |

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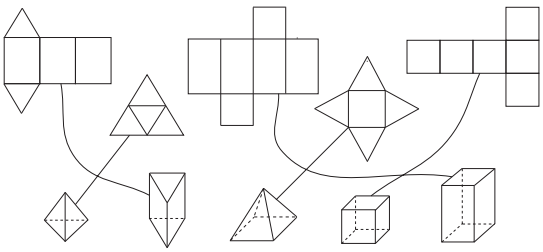
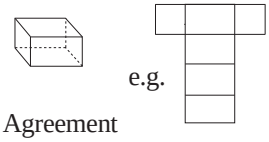
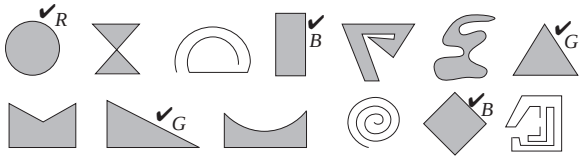
# Y3

*Lesson Plan 106*

| *Activity* | | *Notes* |
|---|---|---|
| **7** | ***PbY3b, page 106, Q.2***<br>a) Let's draw around all the sides of this cuboid. T demonstrates on BB, turning the solid over until all the sides have been drawn. This is called a net for a solid. This is what it looks like when it is cut out in one piece. T has the net already prepared and pre-folded.<br>T asks a P to come out to front and fold the net around the solid. Does it fit? (Yes)<br>T (or P) repeats with, e.g. a pyramid.<br>b) T has 2 or 3 nets already prepared and pre-folded. T shows them to class and Ps try to work out what the solid is. Ask several Ps what they think before checking by folding.<br>c) Read: *Join up the solids to the correct net.*<br>First make sure that Ps know which are the solids (3–D) and which are the nets (2–D).<br>Review at BB with whole class. Ps come out to join up matching pairs. Class agrees/disagrees. (T could have nets and shapes on hand in case of disagreement.)<br>*Solution:*  | Whole class demonstration to start<br>*Solid* BB: Net<br>  <br>Agreement<br><br>Whole class activity<br>In good humour!<br>Agreement, checking, praising<br>Individual work, monitored (helped)<br>Drawn on BB or use enlarged copy master or OHP<br>Reasoning, checking, agreement, self-correcting, praising<br>Ps might notice that the net for the cuboid is different from the one above.<br>T could show by manipulation how other nets are possible for some solids. |
| | *35 min* | |
| **8** | ***PbY3b, page 106***<br>Q.3 Read: *Colour the plane shapes which are bordered by an unbroken line.*<br>*Tick any circle with red, any rectangles with blue and any triangles with green.*<br>Agree that all plane shapes are bordered by an unbroken line. Who remembers the name of this line? (perimeter)<br>Ps colour plane shapes in *Pbs*. Review at BB with whole class. Ps come out to point to plane shapes and to describe them. (e.g. curved or straight sides, number of sides and vertices; parallel and perpendicular lines, right angles)<br>Ps point out the circle, 2 rectangles and 2 triangles.<br>What is this shape called? <br>(pentagon – 5 sides, but not all the same size so is not a regular pentagon like . It is an irregular pentagon )<br>What are the shapes which are not coloured? (lines)<br>*Solution:*  | Individual work, monitored, helped<br>Drawn on BB or use enlarged copy master or OHP<br>BB: perimeter<br>Discussion, explanation, agreement, praising<br>Class suggests missed criteria<br>Agreement, praising<br>BB: pentagon<br>regular irregular<br> <br>Discussion on regular and irregular shapes, e.g. a square is a regular rectangle (all its sides are equal) |
| | *40 min* | |

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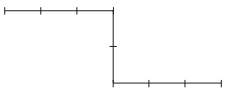
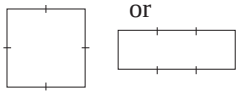
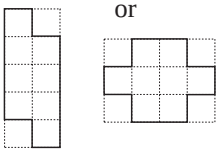
# Y3

*Lesson Plan 106*

| ***Activity*** | | ***Notes*** |
|---|---|---|
| **9** | ***PbY3b, page 106***<br>Q.4 Read: *Draw the shapes described on a squared grid sheet (or in your exercise books).*<br>Deal with one part at a time. Discuss that the unit length is not stated so can be any length, but must be consistent throughout the question. Ps read description and draw the shape.<br>Review at BB with whole class. T shows an example.<br>Who drew something similar? Who drew something different? Come and show us. Class decides whether or not solutions are correct.<br>*a) A line 8 units long which is divided into 3 segments, 2 of them are equal.*<br>BB: e.g.  <br>*b) A rectangle which has perimeter 8 units.*<br>BB:  or<br>*c) A plane shape which has area 8 square units and perimeter 14 units.*<br>BB: e.g.  or | Individual work, monitored, helped<br>(Ps can use 1 cm grid sheets from Y1 or appropriate grids on copy master)<br>Demonstration, discussion, agreement<br>T reminds Ps what a segment is. Elicit that the line need not be completely horizontal or vertical.<br>Only 2 possible solutions unless fractions of units are used.<br>Other solutions are possible. |

*45 min*

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# Y3

R: Calculation practice
**C: Perimeter, area (on square and triangular grids)**
*E: Area of combined shapes*

## *Lesson Plan* *107*

| *Activity* | | *Notes* |
|---|---|---|
| **1** | **Multiplication and division practice**<br>T says a multiplication or division. P says the result.<br>Listen carefully, because if the P before you makes a mistake, you must correct it!<br>*4 min* | Whole class activity<br>At speed. T chooses Ps at random<br>Praising, encouragement only |
| **2** | **Mental calculation practice**<br>T says mixed operations. Ps write only the result in their *Ex. Bks*. e.g.<br>a) $10 \times 23 + 300 = (530)$ b) $250 - 8 \times 5 = (210)$<br>c) $630 + 370 = (1000)$ d) $1000 \div 10 - 35 = (65)$<br>e) $990 \div 9 + 140 = (250)$ f) $320 \div 8 \times 2 = (80)$<br>g) $450 \div 5 + 10 = (100)$ h) $854 + 123 - 77 = (900)$<br>i) $1500 - 25 \times 2 = (1450)$ j) $789 - 11 \times 10 = (679)$<br>Review orally with whole class. Ps change pencils to mark own work. Ps give the answers and explain reasoning. Mistakes dicussed/ corrected.<br>Who had all correct? Who had 1 mistake (2, 3, 4, 5 or more) mistakes?<br>*10 min* | Individual work, monitored<br>T walks round class while reading the questions<br>T can substitute other operations according to needs and ability of class<br>Reasoning, agreement, self-correction, praising<br>Stars, stickers, etc. awarded |
| **3** | **Inequalities**<br>Let's find the numbers which make these statements true.<br>Class reads statement in unison. Ps come to BB to do calculations and to write possible numbers, explaining reasoning. Rest of class helps where necessary, points out errors or suggests easier ways to calculate.<br>BB:<br>a) $648 + 50 \times a = 998$, $50 \times a = 998 - 648 = 350$; $a = 350 \div 50 = 35 \div 5 = \underline{7}$<br>$648 + 50 \times b < 998$, $b < 7$ (6, 5, 4, . . .)<br>$648 + 50 \times c \geq 998$, $c \geq 7$ (7, 8, 9, . . .)<br>b) $200 \times d - 126 = 674$, $200 \times d = 674 + 126 = 800$; $d = 800 \div 200 = 8 \div 2 = \underline{4}$<br>$200 \times e - 126 > 674$, $e > 4$ (5, 6, 7, . . .)<br>$200 \times f - 126 \leq 674$, $f \leq 4$ (4, 3, 2, . . .)<br>c) $1234 - 90 \times g = 604$, $90 \times g = 1234 - 604 = 630$; $g = 630 \div 90 = 63 \div 9 = \underline{7}$<br>$1234 - 90 \times h \leq 604$, $h \geq 7$ (7, 8, . . .)<br>$1234 - 90 \times i > 604$, $i < 7$ (6, 5, . . .)<br>d) $j \div 3 + 567 = 867$, $j \div 3 = 867 - 567 = 300$; $j = 300 \times 3 = \underline{900}$<br>$k \div 3 + 567 \leq 867$, $k \leq 900$ ( 900, 899, . . .)<br>$l \div 3 + 567 \geq 867$, $l \leq 900$ (900, 901, 902, . . .)<br>$998 - 648 = 350$; $674 + 126 = 800$; $1234 - 604 = 630$<br>*18 min* | Whole class activity<br>T has BB or SB or OHT already prepared an uncovers each as it is dealt with.<br>Allow Ps to suggest what to do first and how to continue. T gives hints if necessary.<br>Reasoning, agreement, checking, praising<br>Check by replacing the letters with 1 or 2 possible numbers.<br>Expect only whole positive numbers but give extra praise if Ps suggest fractions and negative numbers too.<br>In part c), Ps might have difficulty understanding why the signs are reversed. Show that, e.g. $h = 6$ and $i = 8$ do not make the statements true. Also show on appropriate segments of the number line if possible.<br>In part d), use multiples of 3 to check $k$ (e.g. 900, 666) and $l$ (e.g. 900, 936). |

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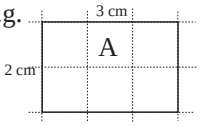
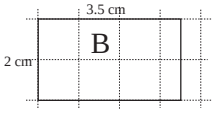
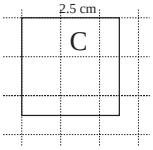
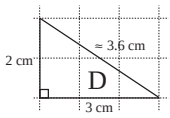
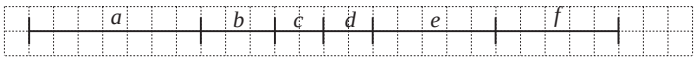
# Y3

*Lesson Plan 107*

| *Activity* | | *Notes* |
|---|---|---|
| **4** | **Perimeter**<br>Ps each have the same copies of shapes on desk cut from coloured paper (e.g. rectangles, square, right-angled triangle) and rulers or measuring grids (parts of 1 cm or 0.5 cm grids copied onto A4 transparencies and cut into smaller pieces) on desks.<br>We want to find out what the <u>perimeter</u> of each shape is. Elicit that perimeter means 'all the the way round the outside'. How could we do it? (Measure each side, then add them up). T reminds Ps that, e.g. 3 and a half cm can be written as 3.5 cm.<br>Ps measure one shape at a time in pairs, one measures and the other notes the data. Both do the necessary calculations in their *Ex. Bks.*<br>Review at BB with whole class. Discuss different ways to do the calcualtions.<br>e.g.<br>  <br>$P$ = 2 cm + 3 cm + 2 cm + 3 cm = <u>10 cm</u>, or<br>$P$ = 2 × (2 cm + 3 cm) = 2 × 5 cm = <u>10 cm</u><br>  <br>$P$ = 2 cm + 3.5 cm + 2 cm + 3.5 cm = <u>11 cm</u>, or<br>$P$ = 2 × (2 cm + 3.5 cm) = 2 × 5.5 cm = <u>11</u> cm<br>  <br>$P$ = 2.5 cm + 2.5 cm + 2.5 cm + 2.5 cm = <u>10 cm</u><br>or<br>$P$ = 4 × 2.5 cm = 8 cm + 2 cm = <u>10 cm</u><br>  <br>$P$ = 2 cm + 3 cm + 3.6 cm = <u>8.6 cm</u>, or<br>$P$ = 20 mm + 30 mm + 36 mm = <u>86 mm</u><br>*25 min* | Paired work in measuring and recording data.<br>Individual work in calculating<br>T can use copy master, copied on coloured paper and cut out<br>BB: <u>Perimeter</u><br>Discussion on shapes such as : <u>square</u> (only need to measure 1 side as all sides are the same; <u>rectangle</u> (only need to measure 1 long and 1 short side, as other 2 sides are the same as these)<br>Ps use rulers or measuring grids from *LP 106/9.2.*<br>Reasoning, agreeement, praising<br>Accuracy of measurements will vary according to the ability of Ps.<br>Ps might give measurements involving fractions of a cm in decimals or in mm. Praise both ways.<br>**Extension**<br>Ps measures perimeter of faces on cubes and cuboids |
| **5** | ***PbY3b, page107***<br>Q.1 Read: *How long is the perimeter of this shape?*<br>*First draw the perimeter as one horizontal line.*<br>*Draw each side in letter order and label it.*<br>Ps draw in *Pbs*, then count the total number of grid squares. (24)<br>Review at BB with whole class. Mistakes corrected. Elicit that the side of each grid square measures half a cm (0.5 cm or 50 mm).<br>*Solution:*<br>  <br>7 + 3 + 2 + 2 + 5 + 5 = 24<br>Deal with parts a), b) and c) one at a time.<br>a) *If the unit used is half a cm, then Perimeter = how many units?* ( <u>24</u> units)<br>b) *If the unit used is 2 half cm (1 cm) , then Perimeter = how many units?* (<u>12</u> units)<br>c) *If the unit used is 3 half cm (1 and a half cm) , then Perimeter = how many units?* ( <u>8</u> units ) | Individual work, monitored, (helped)<br>Drawn on BB or use enlarged copy master or OHP<br>Ps use rulers to draw lines and measure grid squares.<br>Reasoning, agreement, self-correcting, praising<br>Reasoning, agreement, praising<br>Ps can check a) by counting. Rest can be done by calculation<br>BB: 24 ÷ 2 = <u>12</u> units<br>24 ÷ 3 = <u>8</u> units |
| **Extension** | What is the <u>area</u> of the shape if we use the units in a), b) and c)?<br>Ps come to BB to reason and demonstrate. Class agrees/disagrees.<br>*30 min* | Discussion, agreement, praising<br>$A$ = 31 □ = $7\frac{3}{4}$ ⊞ = $3\frac{4}{9}$ ▦ $cm^2$ |

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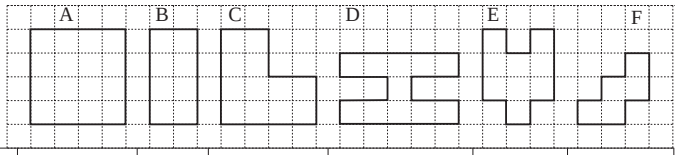
# Y3

*Lesson Plan 107*

| *Activity* | | *Notes* |
|---|---|---|
| **6** | ***PbY3b, page107***<br>Q.3 Read: *Complete the table to show the perimeter (P) and area (A) of each shape.*<br>Ps could label the shapes A, B, C, D, E and F to make discussion easier. Ps count the grid units around and inside each shape and complete the table.<br>Ps can check the perimeter of each shape by drawing the sides as one long horizontal line in *Ex. Bks.* or on 0.5 cm grid sheets.<br>Review at BB with whole class. Mistakes discussed and corrected.<br>*Solution:* | Individual work, monitored, helped<br>Draw on BB or use enlarged copy master or OHP<br>Use photocopied copy master<br>Discussion, reasoning, agreement, self-correction, praising |

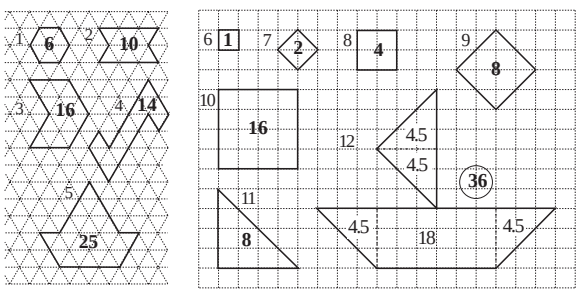


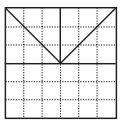

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| *P* | 16 | 12 | 16 | 24 | 16 | 12 |
| *A* | 16 | 8 | 12 | 11 | 9 | 5 |

| | | |
|---|---|---|
| **Extension** | What would the perimeter and area of each shape be in cm?<br>T shows Ps the short way to write 'cm squares' and fractions.<br>Elicit perimeter of shapes: A: 8 cm, B: 6 cm, C: 8 cm, D: 12 cm, E: 8 cm, F: 6 cm<br>Elicit area of shapes. A: 4 $cm^2$, B: 2 $cm^2$, C: 3 $cm^2$, D: $2\frac{3}{4}$ $cm^2$, E: $2\frac{1}{4}$ $cm^2$, F: $1\frac{1}{4}$ $cm^2$ | Whole class activity<br>If a P already knows, let him/her show to class.<br>Reasoning, demonstration, agreement, praising |

*38 min*

| | | |
|---|---|---|
| **7** | ***PbY3b, page107***<br>Q.3 Read: *What is the area of each shape? Write the number of units inside each one. (Shape 12 has been divided up into easier parts.)*<br>What is different about the grid on the LHS? (The grid units are triangles, not squares).<br>Ps count triangles (squares) by putting a pencil dot in each unit as it is counted Deal with shapes 1–5, then 6–11.<br>Review at BB with whole class. Ps give their areas. Class agrees/disagrees. If problems, Ps come to BB to count.<br>*Shape 12* can be done with the whole class. Elicit that 4.5 + 4.5 = 9, so area = (9 + 9 + 18 = 36) unit squares.<br>*Solution:* | Individual work, monitored, helped<br>Draw on BB or use enlarged copy master or OHP<br>Discussion, agreement, self-correction, praising<br>(Or as individual work if Ps wish)<br>T could show *Shape 12* cut up into pieces to form a 6 × 6 square. |



Area = 36 unit squares

| | | |
|---|---|---|
| **Extension** | What is the <u>perimeter</u> of each shape? | Discussion, agreement, praising |

*45 min*

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# Y3

R: Calculation practice

**C: Position. Direction. Motion. Points of the compass (N, S, E, W)**

*E: Compass*

## *Lesson Plan* *108*

| *Activity* | | *Notes* |
|---|---|---|
| **1** | **Missing numbers**<br>Study this table and think about what the rule could be. Class agrees on one form of the rule. Ps come out to BB to choose a column and fill in the missing numbers, explaining reasoning. Ps write difficult calculations at side of BB. Class agrees/disagrees.<br>Who can write the rule in a mathematical way? Who agrees? Who can think of another way? etc.<br>BB: | Whole class activity<br>Table drawn on BB or use enlarged copy master or OHP<br>At a good pace<br>Discussion, reasoning, agreement, praising<br>e.g. BB: 473 + 254 = 727; 943 − 547 = 396<br>(Only last 2 columns involve crossing tens) |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| *a* | 300 | 160 | 235 | 400 | 230 | **533** | **633** | 1406 | 473 | 547 |
| *b* | 200 | 620 | 340 | **600** | **620** | 326 | 162 | **590** | 254 | **396** |
| *c* | 500 | 780 | **575** | 1000 | 850 | 859 | 795 | 1996 | **727** | 943 |

*Rule:* $c = a + b$, $b = c - a$, $a = c - b$

*8 min*

| | | |
|---|---|---|
| **2** | **Problems**<br>Listen carefully to the data and the questions. You can write the data and do any calculations in your *Ex. Bks* if you wish. You might even be able to do some in your head!<br>a) *Sam has £8.15 and Ted has £5.73. What is the difference between their amounts of money?*<br>**A**, come and show us how you worked out the answer. Who agrees? Who did it another way? etc.<br>BB: e.g. S: £8.15 = 815 p, T: £5.73 = 573 p<br>S – T = 815 p – 573 p = 312 p – 70 p = 242 p = £2.42 or 815 p − 573 p = 242 p<br>b) *What would the difference be if :*<br>*i) Sam was given an extra £1*? (£2.42 + £1 = £3.42)<br>*ii) Ted was given an extra £1.20*? (£2.42 – £1.20 = £1.22)<br>*ii) Sam spent £2*? (£2.42 – £2 = £0.42 or 42 p)<br>*iii) Ted spent £1.50*? (£2.42 + £1.50 = £3.92)<br>iv) *they were both given £1?* (£2.42 – difference doesn't change)<br>*v) they both spent £2*? (£2.42 – difference doesn't change)<br>vi) *Sam was given 50 p and Ted spent 50p?* (£2.42 + £1 = £3.42)<br>vii) *Sam spent 50 p and Ted was given 50 p?* (£2.42 – £1 = £1.42) | Whole class activity<br>T repeats slowly<br>Give Ps time to think and calculate<br>Discussion, reasoning, agreement, praising<br>Deal with one part at a time.<br>T chooses Ps to give answers and explain reasoning. Class agrees/disagrees (or responses shown in unison on command)<br>Extra praise if Ps realise part b) can be done mentally.<br>At a good pace<br>Show the changes on a number line if necessary.<br>Praising, encouragement only |

*15 min*

| | | |
|---|---|---|
| **3** | **Position**<br>N.B. This needs to be adapted according to the seating in your class.<br>T gives Ps instructions. (Columns counted from front, rows from left.)<br>• The pupil in the 2nd row and 3rd column, stand up and put your hands on your head! . . . now!<br>• The pupil in the 6th column and 5th row, stand up and clap your hands.<br>• Pupils in the 1st row, stand up and shout 'Abracadabra'. . . . now!<br>• Pupils in the 1st column, stand up and turn around. . . . now!<br>• Pupils in either the 4th column or the 3rd row, stand up and hold your ears. . . . now! | Whole class activity<br>Actions, rows and columns can be suggested by Ps.<br>Actions carried out in unison<br>Class points out mistakes.<br>Agreement, praising<br>All done in good humour!<br>Feedback for T |

*20 min*

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# Y3

*Lesson Plan 108*

| *Activity* | | *Notes* |
|---|---|---|
| **4** | **Direction**<br>a) Class stands up and T gives instructions. e.g.<br>• Put up your left hand . . now!<br>• Put your right hand on your head . . . now!<br>• Put your right hand on your left shoulder . . . now!<br>• Hold your right ear with your left hand . . . now!<br>• Put your left hand on your left elbow . . now! (Impossible!)<br>b) **B**, stand up. You will be my robot and you must do what I say. Move 4 steps forwards. Make a quarter turn to the right. Make half a turn to the left. Make a quarter turn to the left. Move 4 steps backwards. Move 8 steps forwards. Make a whole turn to the right. Sit down.<br>c) T shows a local map. This is where we are. If we travelled north, how would we move? B, come and show us. (up) Who agrees? If we travelled south, how would we move? (down) Repeat for East and West. (to right and left)<br>This is a compass. Its arrow always points North. I wonder which direction is North in the classroom? P comes out to read the compass and points to North. T sticks a large 'N' on the wall. Everyone stand up and face North. Where is South? (Behind us) Let's turn to face South. T sticks a large 'S' on the wall. Elicit that Ps made half a turn from North to face South.<br>Everyone turn to face North again. Repeat for East (West). Elicit that Ps made a quarter turn to the right (left) from North.<br>*25 min* | Whole class activity<br>At speed. In unison.<br>In good humour!<br>T notes Ps having problems<br>Praising, encouragement only<br>Class gives hints or points out errors.<br>Repeat with a different P as the robot and other Ps giving instructions. T repeats unclear instructions correctly.<br>Ps could have maps and compasses on desks too if possible.<br>BB: Compass<br>Letters need only be kept on walls until T is sure that the majorityof Ps know the directions.<br>If time, Ps practice turning to face compass directions given by T (or Ps) in random order. |
| **5** | ***PbY3b, page 108***<br>Q.1 Read: *Write the opposite part of each pair.*<br>Review at BB with whole class. Mistakes discussed and corrected.<br>T asks for (or Ps suggests) other pairs of opposites. (e.g. near – far, under – over, few – many, positive – negative, North – South, etc.)<br>*Solution:*<br>Low — **High**; Small — **Large**<br>Under — **Over**; Less — **More**<br>Right — **Left**; Front — **Back**<br>Up — **Down**; Thick — **Thin**<br>*30 min* | Individual work, monitored<br>Written on BB or use enlarged copy master or OHP<br>Agreement, self-correcting, praising<br>Extra praise for good suggestions |

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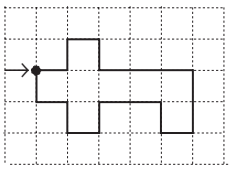
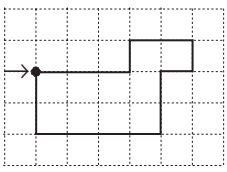
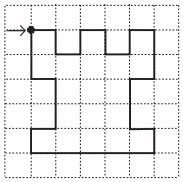
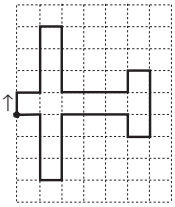
# Y3

*Lesson Plan 108*

| *Activity* | | *Notes* |
|---|---|---|
| **6** | ***PbY3b, page 108, Q.2***<br>T has a similar plan of own classroom drawn on BB or SB or OHT (or with individual items cut out and stuck to BB) | Whole class activity to start<br>If seats are in arcs instead of rows, adapt the terms to suit. |
| | a) T calls Ps out to point to certain rows, columns, or Ps. | At a good pace<br>Agreement, praising |
| | b) Ps come to BB to point to their own usual position in the class room and describe where it is. (e.g. Column 2, Row 3) | |
| | c) Read: *This is a plan of a classroom. Follow the instructions.*<br>T explains that the rows are counted from the front and columns are counted from the left. Elicit that, e.g., C2, R1 means Column 2, Row 1.<br>Ps tick or colour according to the instructions.<br>Review at BB with whole class. Ps come out to BB to show their solutions. Class agrees/disagrees. Mistakes corrected. | Individual work, monitored, helped<br>Drawn on BB or use enlarged copy master or OHP<br>Agreement, self-correcting, praising |
| | d) T chooses Ps at random. They describe where they are relative to other Ps. e.g. 'I am behind **A** and in front of **B**, **C** is on my left and **D** is on my right', or '**A** is in front of me and **B** is behind me, I am on the right of **C** and on the left of **D**'. | Involve several Ps<br>Class points out errors.<br>Agreement, praising |
| **Extension** | Ps could be given copies of their own classroom plan and write the initials of their classmates in the correct positions. | Can be done at home If Ps wish. |
| | *37 min* | |
| **7** | ***PbY3b, page 108***<br>Q.3 Read: *Follow the instructions and draw the pictures.*<br>Elicit that R = Right, L = Left, D = Down, U = Up, the starting point is the black dot, the first move is in the direction of the arrow and that *P* = Perimeter and *A* = Area.<br>Deal with one part at a time. Ps complete the drawing according to the instructions, then count the units and write in the perimeter and area. Review at BB with whole class. Ps come out to show what they have done and class agrees/disagrees. Mistakes corrected. | Individual work monitored, helped<br>Diagrams drawn on BB or use enlarged copy master or OHP<br>Initial whole class discussion on meaning of abbreviations<br>Agreement, self-correction, praising |
| | Read: *Write instructions on how to draw the pictures.*<br>Deal with one part at a time. Ps start at the dot and write instructions at side of diagram in *Pbs.* Then they count the units and write in the perimeter and area. Review at BB with whole class. Ps dicatate to T and class agrees/disagrees. Mistakes corrected. | What do the drawings remind you of? Ask several Ps what they think. (In good humour!) |
| | *Solution*:<br>a)  <br>*P* = 18 units<br>*A* = 8 square units<br>b)  <br>*P* = 16 units<br>*A* = 10 square units<br>c)  <br>*P* = 28 units<br>*A* = 19 square units<br>d)  <br>*P* = 30 units<br>*A* = 14 square units | Instructions for:<br>c) R1, D1, R1, U1, R1, D1, R1, U1, R1, D2, L1, D2, R1, D1, L5, U1, R1, U2, L1, U2<br>d) U1, R1, U3, R1, D3, R3, U1, R1, D3, L1, U1, L3, D3, L1, U3, L1 |
| **Extension** | | Ps take grid sheets home, draw own shape and write instructions on how to draw it.<br>Ps draw neighbour's shapes in *Lesson 110*. |
| | *45 min* | |

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# Y3

R: Review: calculation

**C: Compass directions. Right-angle turns**

*E: NW, NE, SW, SE*

## *Lesson Plan* *109*

| *Activity* | | *Notes* |
|---|---|---|
| **1** | **Mental multiplication and division practice**<br>T says a multiplication or division. P says the result. e.g.<br>$7 \times 6,\ 3 \times 8,\ 5 \times 7,\ 6 \times 4$, etc.; $48 \div 6,\ 49 \div 7,\ 63 \div 9$, etc.;<br>$9 \times 1,\ 9 \times 10,\ 9 \times 100;\ 17 \times 1,\ 17 \times 10, 17 \times 100$, etc.;<br>$24 \div 3,\ 140 \div 7,\ 160 \div 40;\ 27 \div 9,\ 270 \div 9,\ 270 \div 90$, etc.;<br>$0 \times 100,\ 10 \times 21,\ 2 \times 50,\ 3 \times 33,\ 4 \times 25,\ 5 \times 50,\ 8 \times 51$, etc.<br>*4 min* | Whole class activity<br>T chooses Ps at random<br>If a P makes a mistake, the next P corrects it.<br>At speed<br>Praising, encouragement only |
| **2** | **Missing numbers**<br>Study this table and think about what the rule could be. Class agrees on one form of the rule. Ps come out to BB to choose a column and fill in the missing numbers, explaining reasoning. Ps write difficult calculations at side of BB or in *Ex. Bks*. Class agrees/disagrees.<br>Who can write the rule in a mathematical way? Who agrees? Who can think of another way? etc.<br>BB:<br>*Rule:* $c = a - b,\quad b = a - c,\quad a = b + c$<br>*11 min* | Whole class activity<br>Table drawn on BB or use enlarged copy master or OHP<br>At a good pace<br>Discussion, reasoning, agreement, praising<br>BB: e.g.<br>Encourage Ps to use the words: 'reductant,' 'subtrahend' and 'difference' in their reasoning. |
| **3** | **Problems**<br>Listen carefully, write the data and do the calculation in your *Ex. Bks.* Show me your answer when I say.<br>a) *After a sponsored run for charity, a school collected 196 £1 coins, 55 £2 coins and 23 £10 notes. How much money did the school collect altogether?*<br>Show me your answer . . . now! (£536)<br>**A**, tell us how you worked it out. Who agrees? Who did it a different way? **B**, what mistake did you make? etc.<br>BB: $196 \times £1 + 55 \times £2 + 23 \times £10$<br>$= £196 + £110 + £230$<br>$= \underline{£536}$<br>*Answer*: The school collected £536 altogether.<br>b) *Bella had £15.67. She bought 20 postcards at 45 p each. How much money did she have left?*<br>Show me your answer . . . now! (£6.67 or £6 67 p or 667 p)<br>**C**, tell us how you worked it out. Who agrees? Who did it a different way? **D**, what mistake did you make? etc.<br>BB: Had: £15.67 = 1567 p<br>Spent: $20 \times 45$ p $= 2 \times 10 \times 45$ p $= 2 \times 450$ p $= 900$ p<br>Had left: 1567 p – 900 p = 667 p<br>= £6 67 p<br>= £6.67<br>*Answer*: She had £6.67 left. | Individual work, monitored<br>T repeats slowly.<br>In unison (on scrap paper or plastic 'slates')<br>Reasoning, agreement, self-correction, praising<br>Check by adding in opposite direction.<br>Ps say answer as a sentence.<br>T repeats slowly.<br>In unison (on scrap paper or plastic 'slates')<br>Reasoning, agreement, self-correction, praising<br>Check by doing addition.<br>Ps give answer in different ways: pence, £s and p, £s.<br>Ps say answer as a sentence. |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| *a* | 700 | 670 | 835 | 1365 | 1453 | **790** | **1629** | 1675 | 555 | 320 |
| *b* | 200 | 150 | 210 | 1132 | 343 | 375 | 518 | **1220** | 268 | **173** |
| *c* | 500 | 520 | **625** | **233** | **1110** | 415 | 1111 | 455 | **287** | 147 |

$$\begin{array}{rrrr} 415 & 518 & 1675 & 555 \\ +\ 375 & +1111 & -\ 455 & -268 \\ \hline 790 & 1629 & 1220 & 287 \end{array}$$

$$\begin{array}{r} 196 \\ 110 \\ +\ 230 \\ \hline 536 \end{array} \qquad \begin{array}{r} 1567 \\ -\ 900 \\ \hline 667 \end{array}$$

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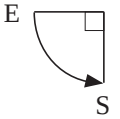
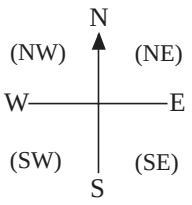
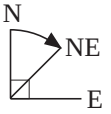
# Y3

*Lesson Plan 109*

| ***Activity*** | | ***Notes*** |
|---|---|---|
| 3 | (Continued)<br>c) *Last month, Cilla saved up 198 1 p coins, 25 5 p coins and 40 2 p coins. This month she saved up another £8.96.*<br>*How much money does Cilla have now?*<br>Show me your answer . . . now! (£12.99)<br>**E**, tell us how you worked it out. Who agrees? Who did it a different way? **F**, what mistake did you make? etc.<br>BB: e.g. Last month: 198 × 1 p + 25 × 5 p + 40 × 2 p = 198 p + 125 p + 80 p = 403 p<br>This month: £8.96 = 896 p<br>Now has: 403 p + 896 p = 1299 p = £12.99<br>198 + 125 + 80 = 403<br>403 + 896 = 1299<br>*Answer*: Cilla now has £12.99. | T repeats slowly.<br>Ps sit up with arms folded when ready.<br>In unison (on scrap paper or plastic 'slates')<br>Reasoning, agreement, self-correction, praising<br>Or calculation done as one addition:<br>198<br>125<br>80<br>+ 896<br>1299<br>or 403 p = £4.03<br>£4.03 + £8.96 = £12.99 |
| | *20 min* | |
| **4** | **Direction**<br>a) Everyone stand up and face North. Follow my instructions and tell me in which direction you end up facing when I say.<br>• Make a quarter turn to the left. Tell me . . . now! (West)<br>• Make a half turn to your left. Tell me . . . now! (East)<br>• Turn a right angle to your right. Tell me . . . now! (South)<br>(If a P does it correctly, allow P to explain. Otherwise T demonstrates that turning through a right angle is the same as a making a quarter turn.)<br>• Turn 2 right angles to your left. Tell me . . .now! (North)<br>Elicit that turning through 2 right angles is the same as making half a turn.<br>b) T shows class a real compass. Who has seen a compass being used? Ps tell class their experiences. If nobody has, T talks about its uses. (e.g. orienteering, hiking, sailing, being lost on a moor or in the snow or at sea or in the desert (where there are no landmarks to guide you) etc, and how the sun rises in the East and sinks in the West, etc.)<br>T draws a cross on BB. Ps dictate where T should write N, S, E, W. Who knows where North-West (South-East,) etc. would be? Ps come out to show them. Class agrees/disagrees. Elicit that, e.g. North-West is exactly half-way between North and West.<br>Ps draw the compass points in their *Ex. Bks*. Lay your pencil on the arrow pointing towards North on the diagram. Turn it through a right angle to the right. Where is it pointing now? (East)<br>Repeat with other similar instructions.<br>Lay your pencil along the arrow pointing to North again. Now turn it so that it points NE. What kind of turn has it made? (half a right angle, or 1 eighth of a turn) T demonstrates on BB too.<br>Now point the arrrow showing North in your *Ex. Bks* to the real direction North (towards 'N' on the wall). T checks quickly. | Whole class activity<br>'N' still on classroom wall<br>Ps shout out in unison<br>In good humour!<br>BB: 1 right angle turn<br>  <br><br>= 1 quarter of a turn<br>If possible, Ps have small compasses on desks .<br>Discussion on the compass and compass points.<br>BB:<br>  <br><br>Ps shout out in unison<br>Ps can choose the compass points too.<br>BB: half a right angle turn<br>  <br><br>= 1 eighth of a turn |
| | *26 min* | |

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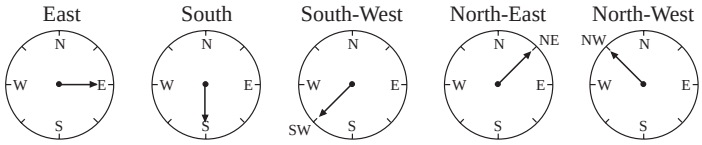
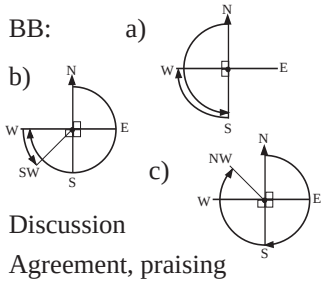
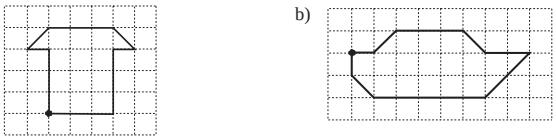
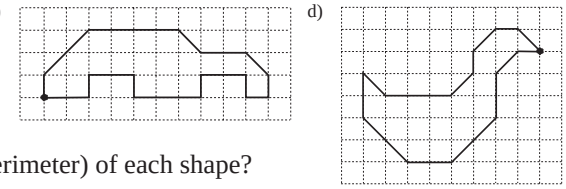
# Y3

*Lesson Plan 109*

| *Activity* | | *Notes* |
|---|---|---|
| **5** | ***PbY3b, page 109***<br>Q.1 Read: *Draw an arrow on each compass so that it points in the given direction.*<br>Encourage Ps to use rulers to draw the arrows.<br>Review at BB with whole class. Mistakes discussed and corrected.<br>*Solution:*<br>  <br><br>What kind of turn has been made from one compass to another? (e.g. E to S: 1 quarter turn (or 1 right angle turn) to the right); S to SW: 1 eighth of a turn (half a right angle turn) to the right); etc.<br>*30 min* | Individual work. monitored, helped<br>Drawn on BB or use enlarged copy master or OHP<br>Reasoning, agreement, self-correction, praising<br>Discussion, agreement, praising. Encourage Ps to explain in sentences. |
| **6** | ***PbY3b, page 109, Q.2***<br>Read: *Start facing North. Follow the instructions. In which direction are you facing?*<br>Everyone stand up and face North. (N should still be on the wall of classroom but other letters can be removed if T thinks Ps can cope.)<br>T gives directions and Ps turn accordingly. In which direction are you facing now? Class shouts out compass point. T confirms by showing on diagram on BB. (Draw or use enlarged copy master.)<br>a) *Turn 2 right angles to the left, then 1 right angle to the right.* (W)<br>b) *Turn 3 right angles to the right, then half a right angle to the left.* (SW)<br>c) *Turn 2 right angles to the right, then 1 and a half right angles to the right.* (NW)<br>*35 min* | Whole class activity<br>Ps could practice turning 1 right angle (half a right angle, 2 right angles) first.<br>In good humour!<br>Direction given on command<br>BB: a) b) c)<br>  <br><br>Discussion<br>Agreement, praising |
| **7** | ***PbY3b, page 109***<br>Q.3 Read: *Start from the point. Follow the instructions and draw the shape.*<br>Elicit that N = North, S = South, E = East, W = West<br>Deal with one part at a time. Review at BB with whole class. Ps who drew a different shape analyse their mistakes.<br>Which shape was drawn in a different way from the others? (Only *shape c* was drawn in an anti-clockwise direction.)<br>*Solution:* a) b)<br>  <br>c) d)<br>  <br>What is the area (perimeter) of each shape?<br>*42 min* | Individual work, monitored, helped<br>T has solution already prepared on BB, SB or OHT for discussion.<br>T asks Ps what each shape reminds them of.<br>In good humour! |
| **Extension** | | Whole class activity or individual work in *Pbs*, reviewed with whole class |

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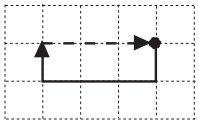
| **Y3** | | *Lesson Plan 109* |
|---|---|---|
| ***Activity*** | | ***Notes*** |
| **8** | ***PbY3b, page 109, Q.4***<br>Read: *A man walked 1 km South, then 3 km West, then 1 km North. How far in which direction does he still have to walk to get back to his starting point?*<br>Ps suggest how to start and what to do next. Ps come to BB or dictate to T. Class discusses how to write the solution.<br>*Method of solution:*<br>• Use a large grid drawn on BB or OHT. (Scale: 1 grid unit $\rightarrow$ 1 km)<br>• Start with a dot. (Ps decide where it should be drawn) and draw the man's route.<br>• Count how many units still to go in which direction to get back to starting dot. (3 units)<br>• Answer question in a sentence.<br>*45 min* | Whole class activity<br>(or individual work in *Ex. Bks* if Ps wish)<br>Grid drawn on BB<br>Reasoning, agreement, praising<br>Agreement, praising<br>*Solution:*  <br>He still has to walk <u>3 km East</u>. |

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# Y3

## *Lesson Plan 110*

***Activity***

***Notes***

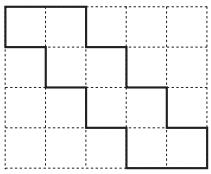
Calculation practice, revision, activities, consolidation

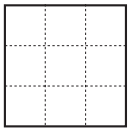
*PbY3b, page 110*

*Solutions:*

1. a) 365, 390, 415, **440, 465, 490,** 515, 540, 565 (+ 25)
   b) 315, 385, 455, **525, 595, 665,** 735, 805, 875 (+ 70)
   c) 1203, 1143, 1083, **1023, 963, 903,** 843, 783, 723 (– 60)
   d) 1105, 1070, 1035, **1000, 965, 930,** 895, 860, 825 (– 35)

2. a)
   A = 8 square units
   P = 12 units

   b) 
   A = 8 square units
   P = 18 units

   c) 
   P = 12 units

3. a) $197 + 100 \overset{10}{\div} 10 = \underline{207}$
   b) $874 - 50 \overset{250}{\times} 5 = \underline{624}$
   c) $60 \overset{360}{\times} 6 + 512 = \underline{872}$
   d) $270 \overset{30}{\div} 9 + 888 = \underline{918}$
   e) $(614 \overset{699}{+} 85) \div 3 = \underline{233}$
   f) $320 \div (1000 \overset{32}{-} 968) = \underline{10}$
   g) $150 \overset{300}{\times} 2 + 720 = \underline{1020}$
   h) $(390 \overset{320}{-} 70) \div 4 = \underline{80}$

4. i) $690 + \boxed{a} = 943$ ii) $865 - \boxed{d} = 553$ iii) $\boxed{g} - 597 = 634$
   $a =$ **253** $d =$ **312** $g =$ **1231**

   $300 + \boxed{b} < 412 \overset{313}{-} 99$ $865 - \boxed{e} \geq 442$ $\boxed{h} - 486 < 523$
   $b$ : **< 13** $e$ : **≤ 423** $h$ : **< 1009**

   $456 + \boxed{c} = 832$ $865 - \boxed{f} < 442$ $\boxed{i} - 486 > 523$
   $c =$ **376** $f$ : **> 423** $i$ : **> 1009**

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