### Activity 1

**Combinatorics**

In how many different ways can we write the word ‘ONE’ if we can read the letters by taking one step to the right or 1 step down?

Ps come to BB to show the different ways. Who agrees? Who can think of another way? etc. Agree that there are 4 ways.

BB:

a) \[
\begin{array}{c}
\text{O} \\
\text{N} \\
\text{E}
\end{array}
\quad
\begin{array}{c}
\text{O} \\
\text{N} \\
\text{E}
\end{array}
\quad
\begin{array}{c}
\text{O} \\
\text{N} \\
\text{E}
\end{array}
\quad
\begin{array}{c}
\text{O} \\
\text{N} \\
\text{E}
\end{array}
\]

4 different ways

We can show them as one diagram like this. BB: \[
\begin{array}{c}
\text{O} \\
\text{N} \\
\text{E}
\end{array}
\quad
\begin{array}{c}
\text{N} \\
\text{E} \\
\text{E}
\end{array}
\quad
\begin{array}{c}
\text{E} \\
\text{N} \\
\text{E}
\end{array}
\quad
\begin{array}{c}
\text{E} \\
\text{E} \\
\text{N}
\end{array}
\]

Class checks that all the 4 possible ways are shown.

Let’s think of how many different ways we can get to each position.

T points to each letter in turn and Ps say how many different ways they can get to it. T writes as numbers on BB. T circles the ‘end’ numbers and writes it as an addition.

BB:

\[
\begin{array}{c}
\text{O} \\
\text{N} \\
\text{E}
\end{array}
\quad
1 + 1 + 2 + 1 = 4
\]

Repeat for 4-letter and 5-letter words, e.g.

b) \[
\begin{array}{c}
\text{M} \\
\text{O} \\
\text{R} \\
\text{O} \\
\text{R}
\end{array}
\quad
\begin{array}{c}
\text{O} \\
\text{R} \\
\text{E} \\
\text{E} \\
\text{E}
\end{array}
\quad
\begin{array}{c}
\text{E} \\
\text{E} \\
\text{E} \\
\text{E} \\
\text{E}
\end{array}
\quad
\begin{array}{c}
\text{E} \\
\text{E} \\
\text{E} \\
\text{E} \\
\text{E}
\end{array}
\]

1 + 3 + 3 + 1 = 8 (different ways)

\[
\begin{array}{c}
\text{S} \\
\text{U} \\
\text{G} \\
\text{A} \\
\text{R}
\end{array}
\quad
\begin{array}{c}
\text{U} \\
\text{G} \\
\text{A} \\
\text{R} \\
\text{A}
\end{array}
\quad
\begin{array}{c}
\text{G} \\
\text{A} \\
\text{R}
\end{array}
\quad
\begin{array}{c}
\text{A} \\
\text{R}
\end{array}
\quad
\begin{array}{c}
\text{R}
\end{array}
\]

1 + 4 + 6 + 4 + 1 = 16 (different ways)

\[
\begin{array}{c}
\text{O} \\
\text{N} \\
\text{E}
\end{array}
\quad
1 + 2 + 1 = 4
\]

**Lesson Plan**

1. **Week 1**

- **R:** Mental calculation
- **C:** Revision: numbers to 1000. Writing and ordering. Rounding
- **E:** Numbers up to 2000

**Activity 1**

**Combinatorics**

- In how many different ways can we write the word ‘ONE’ if we can read the letters by taking one step to the right or 1 step down?
- Ps come to BB to show the different ways. Who agrees? Who can think of another way? etc. Agree that there are 4 ways.
- BB:

  a) \[
  \begin{array}{c}
  \text{O} \\
  \text{N} \\
  \text{E}
  \end{array}
  \quad
  \begin{array}{c}
  \text{O} \\
  \text{N} \\
  \text{E}
  \end{array}
  \quad
  \begin{array}{c}
  \text{O} \\
  \text{N} \\
  \text{E}
  \end{array}
  \quad
  \begin{array}{c}
  \text{O} \\
  \text{N} \\
  \text{E}
  \end{array}
  \]

  4 different ways

  We can show them as one diagram like this. BB:

  \[
  \begin{array}{c}
  \text{O} \\
  \text{N} \\
  \text{E}
  \end{array}
  \quad
  \begin{array}{c}
  \text{N} \\
  \text{E} \\
  \text{E}
  \end{array}
  \quad
  \begin{array}{c}
  \text{E} \\
  \text{N} \\
  \text{E}
  \end{array}
  \quad
  \begin{array}{c}
  \text{E} \\
  \text{E} \\
  \text{N}
  \end{array}
  \]

  Class checks that all the 4 possible ways are shown.

- Let’s think of how many different ways we can get to each position.
- T points to each letter in turn and Ps say how many different ways they can get to it. T writes as numbers on BB. T circles the ‘end’ numbers and writes it as an addition.
- BB:

  \[
  \begin{array}{c}
  \text{O} \\
  \text{N} \\
  \text{E}
  \end{array}
  \quad
  \begin{array}{c}
  1 \\
  1 \\
  2 + 1 = 4
  \end{array}
  \]

  Repeat for 4-letter and 5-letter words, e.g.

  b) \[
  \begin{array}{c}
  \text{M} \\
  \text{O} \\
  \text{R} \\
  \text{O} \\
  \text{R}
  \end{array}
  \quad
  \begin{array}{c}
  1 + 1 + 2 + 3 = 8
  \end{array}
  \]

  (different ways)

  c) \[
  \begin{array}{c}
  \text{S} \\
  \text{U} \\
  \text{G} \\
  \text{A} \\
  \text{R}
  \end{array}
  \quad
  \begin{array}{c}
  1 + 1 + 1 + 1 + 1 = 8
  \end{array}
  \]

  (different ways)

- **Week 2**

  **Problems**

  - Listen to the problem. Think about how you would work out the answer.
  - a) I divided 10 into two parts, then I divided one part by the other part. The quotient is 4. What are the two numbers?
  - T asks several Ps what they think (or the numbers could be written on slates and shown in unison). P answering correctly explains method of solution to the others. Who did the same? Who did it a different way? etc. e.g.
    - i) **Trial and error 1:**
      \[
      \begin{array}{c|c|c}
      a & 7 + 3 & 4 \\
      b & 8 + 2 & 4
      \end{array}
      \]
    - ii) **Trial and error 2:**
      \[
      \begin{array}{c}
      4 \\
      8
      \end{array}
      \]
      \[
      12
      \]
    - Rule: \( b = 4 \times a \)
    - Check: \( 2 + 8 = 10 \)
    - iii) **Equation:**
      \[
      a + 4 \times a = 10
      \]
      \[
      5a = 10
      \]
      \[
      a = 2
      \]
      so one number is 2 and the other is \( 10 - 2 = 8 \) (or \( 4 \times a = 8 \))

- **Notes**

  - Whole class activity
  - Words written on BB or letters on cards stuck to BB.
  - Agreement, praising
  - Ps may notice the easiest way of calculation of the possible cases by themselves.
  - The numbers show the number of routes to that place.
  - Ps could suggest the words.

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Activity

b) I subtracted an even number from an odd number. Then I multiplied the difference by thirteen. Next I doubled the product. Was the result an even or an odd number?

T asks several Ps what they think. Why do you think so? Who agrees? Who thinks something else? etc.

(It must be even as any number multiplied by 2 has an even result. Only the last step (doubling) is important!)

Ps may check it if they wish. e.g.

BB: \(9 - 6 = 3, \ 3 \times 13 = 39, \ 39 \times 2 = 78\), which is even.

Notes

Whole class activity
Give Ps time to think.
Discussion, reasoning, agreement, checking, praising
Extra praise if Ps notice this without help.

3

Making 3-digit numbers

a) Let’s make 3-digit numbers from these number cards. BB: \[3\ [9\ [2\]

Let’s write them in increasing order. Ps dictate to T:

BB: \(239 < 293 < 329 < 392 < 923 < 932\)

Agree that there are 3 possible hundreds digits, then for every hundreds digit there are 2 possible tens digits, then for every tens digit there is only one possible units digit, i.e. \(3 \times 2 \times 1 = 6\) possible numbers.

b) How many 3-digit numbers can we make from 3 digits if we can use a digit more than once? What kind of diagram can we draw to help us? (Tree diagram) Who remember how to draw it?

BB:

Agree that there are 27 possible numbers. Could we have reasoned without drawing the tree diagram? (We had 3 possible choices for the hundreds digit, then 3 choices for the tens digit, then 3 choices for the units digit, i.e. \(3 \times 3 \times 3 = 27\).) T shows in table on BB.

Whole class activity
Number cards stuck on BB
(Ps could have the number cards on desk too.)
Reasoning, agreement, praising
Ps suggest strategy and draw it on BB and in Ex. Bks. with T’s help if necessary.

At a good pace

Reasoning, agreement, praising

BB: \[
\begin{array}{ccc}
H & T & U \\
3 & 3 & 3 \\
\end{array}
\]

T gives hints if Ps cannot think of any.
Praise all contributions.
Extra praise if Ps notice this without help.

4

PbY4a, page 1

Q.1 Read: Write the numbers in the place value table.

Review at BB with whole class. Ps come out to write in the numbers, explaining reasoning. Who made a mistake? What kind of mistake? Deal with all cases.

Lets read the numbers in increasing (decreasing) order.
### Activity 5

#### PbY4a, page 1

**Q.2** Read: *Write these numbers as digits and list them in increasing order.*

T could choose a P to read each number aloud and Ps could write as digits above the words. Then Ps list in order. Review at BB with whole class. Ps dictate what T should write. Mistakes discussed and corrected.

**BB:** 98 < 560 < 605 < 777 < 1418

Let’s round the numbers to the nearest hundred (ten). T points to each number in turn and Ps say the rounded value.

---

### Extension

#### PbY4a, page 1

**Q.3** Read: *Write these numbers in the correct sets.*

Deal with one part at a time. Set a time limit. Review at BB with whole class. Mistakes discussed and corrected.

**Solution:**

\[
\{6, 10, 54, 109, 468, 893, 1000, 1302, 1517, 1999\}
\]

- a) \[\begin{array}{ll}
6 & 1000 \\
10 & 1302 \\
54 & 1517 \\
468 & 1999 \\
\end{array}\]
- b) \[\begin{array}{ll}
1000 & 6 \\
1302 & 109 \\
1517 & 893 \\
\end{array}\]
- c) \[\begin{array}{ll}
10 & 1999 \\
1000 & 109 \\
1302 & 468 \\
1517 & 893 \\
\end{array}\]
- d) \[\begin{array}{ll}
6 & 1000 \\
10 & 1302 \\
54 & 1517 \\
468 & 1999 \\
\end{array}\]

---

### Activity 6

#### PbY4a, page 1

**Q.4** Read: *Study the numbers. Are the statements true or false? Write T or F in each box.*

T chooses a P to read statement aloud. Is it true or false? Show me . . . now! (on slates or scrap paper)

- a) There is at least one number which is odd. (T)
- b) All the numbers are even. (F)
- c) None of the numbers is more than 1500. (T)
- d) There are no whole tens. (F)
- e) Not every number is odd. (T)

Who can think of another statement which means the same as (i.e. is equivalent to) this one? T points to each in turn. Ps suggest statements. Class decides whether it is equivalent.

e.g. a) There is at least one number which is odd. (Not every number is even.)

---

### Notes

- Individual work, monitored, helped
- Agreement, self-correction, praising
- Ps chosen at random. At speed. Class points out errors.

---

### Extension

#### PbY4a, page 1, Q.4

Whole class activity

- (or individual work if Ps wish)
- In unison. Ps give reasons for their answers.

- e.g. 23 is odd
- e.g. 23 is not even
- (the largest, 1499 < 1500)
- (e.g. 1240 is a whole ten)
- (e.g. 802 is even)

**BB:** equivalent

(means the same)

- N.B. 0 is even and can be thought of as no whole ten.
### Lesson Plan

**Y4**

**R:** Mental calculation  
**C:** Numbers up to 1000. Comparison. Rounding  
**E:** Numbers up to 2000. Roman numerals  

<table>
<thead>
<tr>
<th>Activity</th>
<th>Notes</th>
</tr>
</thead>
</table>
| Writing numbers  
1 a) T dictates numbers up to 1000 (2000) and Ps write them in *Ex. Bks.* Review at BB with whole class. Mistakes discussed and corrected.  
b) Ps dictate numbers and choose other Ps to write them as digits on the BB. Class agrees/disagrees.  
T points to some of numbers on BB and Ps round to nearest 10 (100).  
| Individual writing but class kept together.  
T could have numbers already prepared on SB/OHT. Discussion, agreement, self-correcting, praising  
At a good pace! |
| Find the mistakes  
2 *Birdy* has tried to write the same number in different ways but he has make a couple of mistakes. Let’s help him to find and correct them. Ps come to BB to underline the mistake, say why it is wrong and then to write it again correctly. Class agrees/disagrees.  
BB:  
a) 7 hundred + 1 thousand + 3 units;  
1 × 1000 + 7 × 10 + 3 × 1;  
17 hundreds + 3 units; one thousand seven hundred and 3;  
1000 + 700 + 3; 1 thousand + 70 tens + 3 units  
b) 1 × 1000 + 4 × 100 + 3 × 10 + 4 × 1;  
143 tens + 4 units;  
one thousand, four hundred and thirty one; 1000 + 400 + 30 + 4;  
14 hundreds + 34  
| Whole class activity  
Written on BB or SB or OHT or use enlarged copy master  
At a good pace  
Reasoning, agreement, praising  
Feedback for T |
| **PbY4a, page 2**  
3 Q.1 Read: *Fill in the missing numbers, then list them in decreasing order.*  
Set a time limit. Ps write numbers in boxes first. Review with whole class. Mistakes discussed and corrected.  
BB:  
8 × 100 + 5 × 10 = 850  
8 × 100 + 5 × 1 = 805  
1 × 1000 + 6 × 10 = 1060  
1 × 1000 + 8 × 100 = 1800  
1 × 1000 + 6 × 1 = 1006  
1 × 100 + 8 × 10 = 180  
| Individual work, monitored  
Differentiation by time limit  
Operations written on BB or SB or OHT  
Encourage Ps to say the whole equation.  
Make sure that mistakes are corrected before Ps order the numbers.  
Individual work, monitored  
Agreement, self-correction, praising  
|
| **PbY4a, page 2**  
4 Q.2 Read: *Fill in the missing numbers, then list them in increasing order.*  
Set a time limit. Ps write numbers in boxes first. Review with whole class. Mistakes discussed and corrected.  
BB:  
600 + 30 = 630  
300 + 60 = 360  
600 + 3 = 603  
300 + 6 = 306  
| Individual work, monitored  
Differentiation by time limit  
Operations written on BB or SB or OHT  
Encourage Ps to say the whole equation.  
Make sure that mistakes are corrected before Ps order the numbers.  
Individual work, monitored  
Agreement, self-correction, praising  
|
### Lesson Plan 2

#### Notes
- Individual trial in *Ex. Bks* first then whole class review.
- Ps correct wrong numbers or add those missed.
- Agreement, praising
- Or done as a whole class activity. Agreement, praising

#### Activity

<table>
<thead>
<tr>
<th>No.</th>
<th>Activity</th>
<th>Notes</th>
</tr>
</thead>
</table>
| 5   | **Sum of digits is 2**  
In your *Ex. Bks*. write all the numbers up to 1000 which have 2 as the sum of their digits. Ps dictate their numbers and T writes them on BB.  
BB: 2, 11, 20, 101, 110, 200  
Are there any more? (No)  
Now write all the numbers from 1000 to 2000 which have 2 as the sum of their digits. Ps dictate their numbers and T writes them on BB.  
BB: 1001, 1010, 1100, 2000 | 27 min |
| 6   | **PbY4a, page 2**  
Q.3 Read: Write the whole numbers up to 1000 which have the sum of their digits as 3.  
Review at BB with whole class. Ps dictate numbers or come to BB. Class agrees/disagrees. Mistakes discussed/corrected.  
BB: 3, 12, 21, 30, 102, 111, 120, 201, 210, 300 | 32 min |
|     | **Extension**  
Repeat for 1000 to 2000: 1002, 1011, 1020, 1101, 1110, 1200 | |
| 7   | **Equal values**  
Study these numbers. Let’s join up the equal values.  
Ps come to BB to draw joining lines and to explain reasoning.  
Class points out errors.  
Quick revision of Roman numerals. Let’s see what you remember!  
(I = 1, V = 5, X = 10, L = 50, C = 100, D = 500, M = thousand; VI = V + 1 = 6; IV = V – 1 = 4, etc.)  
a) T writes Roman numbers on BB and Ps say them as Arabic numbers.  
(e.g. LVII, CXXXXI, XLIX, etc.)  
b) T (or P) says Arabic numbers and Ps write them as Roman numerals.  
(e.g. 79, 458, 950, 1555, etc.) | 36 min |
| 8   | **PbY4a, page 2**  
Q.4 Read: Write the Roman numerals as Arabic numbers.  
Set a time limit. Review at BB with whole class. Ps come to BB to fill in numbers, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected. Details shown on BB if problems.  
**Solution:**  
a) CV = 105  
b) CXXXIX = 139  
c) CXLVIII = 148  
d) DCLX = 660  
e) CMIX = 909  
f) MCMXCVIII = 1998  
(Or done as a whole class activity if Ps are still unsure.) | 40 min |
<table>
<thead>
<tr>
<th><strong>Activity</strong></th>
<th><strong>Notes</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>9</strong></td>
<td><strong>Lesson Plan 2</strong></td>
</tr>
<tr>
<td><strong>PBY3a, page 2</strong></td>
<td></td>
</tr>
<tr>
<td>Q.5 Read: Write the numbers which have:</td>
<td>Individual trial first, monitored, helped</td>
</tr>
<tr>
<td>a) an even digit as their hundreds digit and 500 as their nearest ten.</td>
<td>(or whole class activity if time is short)</td>
</tr>
<tr>
<td>b) an odd digit as their hundreds digit and 500 as their nearest ten.</td>
<td>Discussion, reasoning, agreement, self-correction, praising</td>
</tr>
<tr>
<td>c) the smallest even digit as their tens digit and 1010 as their nearest ten.</td>
<td>In part c) agree beforehand that 0 is the smallest even digit.</td>
</tr>
<tr>
<td>Deal with one part at a time. Ps write numbers in Pbs.</td>
<td>e.g. a) ( 495 \leq n &lt; 500 )</td>
</tr>
<tr>
<td><strong>Solution:</strong></td>
<td></td>
</tr>
<tr>
<td>a) 495, 496, 497, 498, 499</td>
<td></td>
</tr>
<tr>
<td>b) 500, 501, 502, 503, 504</td>
<td></td>
</tr>
<tr>
<td>c) 1005, 1006, 1007, 1008, 1009</td>
<td></td>
</tr>
<tr>
<td>Who could write the solution to each part as an inequality?</td>
<td></td>
</tr>
</tbody>
</table>

**Extension**

45 min
Lesson Plan

3

Notes

Whole class activity
At speed round class
Agreement, praising
T decides when to stop!
Discussion on general case.

Activity

1
Numbers with digit 1
Let’s list the numbers which have 1 as one of their digits. Let’s list them in increasing order. Ps dictate numbers to T who writes on BB.

BB: 1, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 31, 41, 51, 61, 71, 81, 91, 100, 101, 102, 103, . . .

Extra praise when Ps realise that all numbers with 1 in the units, tens, hundreds and/or thousands columns will be included!

2
Sequences
T says first few terms of a sequence and Ps continue it. What is the rule?

a) 777, 766, 755, (744, 733, 722, 711, 700, 689, 678, 667, . . .)  
   [Rule: – 11]
b) 32, 182, 332, (482, 632, 782, 932, 1082, . . .)  
   [Rule: + 150]
c) 1, 3, 7, 15, 31, (63, 127, 255, 511, 1023, 2047, . . .)  
   [Rule: 2 times the previous term plus 1]
   (For T only:  \( a_{n+1} = a_n \times 2 + 1 \))

3
PbY4a, page 3
Q.1 Read: The rule for the next term in the sequence is:
   3 times the previous term plus 2.
   a) Write the first six terms of the sequence if the first term is 2.
   b) Write the first six terms of the sequence if the first term is 3.

Set a time limit. Ps can do calculations in Ex. Bks if necessary.
Review at BB with whole class. Ps come to BB or dictate terms to T. Class agrees/disagrees. Mistakes corrected.
Solution:
   a) 2, 8, 26, 80, 242, 728 (All terms are even numbers)
   b) 3, 11, 35, 107, 322, 971 (All terms are odd)

4
Which digits?
T writes a string of digits on BB. Which 3 digits would you cross out so that the remaining digits make as great a number as possible without changing the order?
Ps can try it in Ex. Bks first if they wish. X, come and show us which digits you think should be crossed out. What number is left? Class reads it in unison. Who agrees with X? Who thinks something else? etc. Repeat for other strings of digits, e.g.

BB:  a) 987987 \( \rightarrow \) 987987 \( \rightarrow \) 998  (Smallest: 787)
    b) 454532 \( \rightarrow \) 454532 \( \rightarrow \) 553  \( \rightarrow \) 432
    c) 1100345 \( \rightarrow \) 1100345 \( \rightarrow \) 1345  \( \rightarrow \) 1003

Extension
Which digits would you cross out if you wanted to make the smallest number possible?
Lesson Plan 3

Notes

Individual work, monitored (helped)
Tables drawn on BB or use enlarged copy master or OHP
Reasoning, agreement, self-correction, praising
Agree that:
5 is rounded up to nearest 10
50 is rounded up to nearest 100

Feedback for T

Individual work, monitored, helped (or whole class activity if Ps prefer)
Drawn on BB or use enlarged copy master or OHP
Discussion on distance between 'ticks' on the number lines
Do \(a\) and \(b\) with whole class first if Ps are unsure.
Differentiation by time limit
At a good pace
Reasoning, agreement, self-correcting, praising

Extension

- T (or P) points to a tick on a number line and Ps say the number.
- T (or P) says a number and chooses a P to point to its position on a suitable number line.
In good humour!
Lesson Plan 3

Notes

Whole class activity
Drawn on BB or use enlarged copy master or OHP
At a good pace
Reasoning, agreement, correcting, praising
Ps can write numbers in table in Pbs too.

(Or individual work if Ps prefer, reviewed at BB with whole class)
In good humour!
Praising only!

Activity

Y4

PbY4a, page 3. Q.4
Read: Write the numbers in the set diagram.
Elicit that ‘divisible by 5’ means that there is no remainder when that number is divided by 5. Let’s see how quickly we can do this!
Ps come to BB to choose a number, cross it off the list and write it in correct set, explaining reasoning. Class agrees/disagrees.

Solution:

<table>
<thead>
<tr>
<th>The number is divisible by 5</th>
<th>even</th>
<th>odd</th>
</tr>
</thead>
<tbody>
<tr>
<td>5, 100, 909, 0, 217, 1000,</td>
<td>100</td>
<td>5</td>
</tr>
<tr>
<td>13, 352, 1215, 60, 834, 1605,</td>
<td>1000</td>
<td>1215</td>
</tr>
<tr>
<td>78, 900, 1780</td>
<td>0</td>
<td>1780</td>
</tr>
<tr>
<td>The number is not divisible by 5</td>
<td>352</td>
<td>909</td>
</tr>
<tr>
<td></td>
<td>834</td>
<td>217</td>
</tr>
<tr>
<td></td>
<td>78</td>
<td>13</td>
</tr>
</tbody>
</table>

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

45 min
Y4

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

---

 MEP: Primary Project

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**Y4**

**Activity 3**

*PbY4a, page 4*

Q.1 Read: *Continue the pattern. Colour the correct part of the circles in the flow chart.*

Ps continue the pattern first, then try to understand what the flow diagram means. T explains ordinal numbers if necessary.

Review at BB with whole class. Who can explain the flow chart to us? Who knows how to colour the circles? Who agrees? Who thinks something else?

T leads the whole class through the flow chart, explaining clearly and relating to the 3 types of numbers.

*Solution:*

![Flow chart diagram]

---

**Lesson Plan 4**

**Notes**

Individual work, monitored (or whole class activity)

Drawn on BB or use enlarged copy master or OHP (position in an order)

Discussion, agreement, checking, self-correction, praising

Demonstration of, e.g. 15, 22, 29

T says a number and Ps come to BB to show how its circle would be shaded.

e.g. What would the 413th shape be?

413 = 300 + 90 + 21 + 2

so shape would be 🟢

---

**Activity 4**

**Roman numerals**

Who can write these Roman numerals as Arabic numbers?

Ps come to BB to write numbers, explaining reasoning in detail. Class agrees/disagrees. Revise Roman numerals if necessary.

BB:

- CCL = (250)
- CCLXXXI = (281)
- CCCLXIV = (364)
- CDVI = (406)
- DCCLIII = (753)

---

**Activity 5**

*PbY4a, page 4*

Q.2 Read: *Continue the sequences using Roman numerals.*

Set a time limit. Review at BB with whole class. Ps come to BB to write their sequence, explaining reasoning and rule.

Who agrees? Who thinks something else? etc. All mistakes discussed and corrected.

*Solution:*

a) XLVII, LXVII, LXXXVII, (CVII, CXXVII, CXLVII, 47, 67, 87, 107, 127, 147, CLXVII, CLXXXVII, CCVII, . . .) [Rule: + 20]

b) CMI, DCCC, DCCI, (DCI, DI, CDI, CCCI, CCI, 901, 801, 701, 601, 501, 401, 301, 201, CI, I) [Rule: – 100]

---

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Y4

**Activity**

6  
3-digit numbers  
T has numbers written (or stuck) on BB: 0, 1, 2, 3, 4, 5  
Choose from these numbers and make two 3-digit numbers so that:  
a) both are less than 300  
   Show me . . . now! (e.g. 250, 143)  
b) both are greater than 300  
   Show me . . . now! (e.g. 450, 321)  
c) both are even  
   Show me . . . now! (e.g. 210, 534)  
d) the smaller number is odd and the greater number is even.  
   Show me . . . now! (e.g. 341, 502)

30 min

7  
Specified numbers  
a) In your Ex. Bks. write all the numbers which have the greatest odd digit in their tens column and 1000 as their nearest 10.  
Ps dictate to T or come to BB. (995, 996, 997, 998, 999)  
b) Write the number which has 900 and 1000 as the next smaller and greater hundred and which is an equal distance from both.  
Ps could show on scrap paper or slates on command. (950)

30 min

8  
PbY4a, page 4  
Q.3 Read: Round the numbers. Complete the table.  
Set a time limit. Review at BB with whole class. Ps come to BB or dictate to T. Mistakes discussed and corrected.  
Note the case of 1846, which rounds up to the nearest ten and nearest thousand but rounds down to the nearest hundred.  

Solution:

<table>
<thead>
<tr>
<th>Number</th>
<th>Rounded to the nearest:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ten</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>36</td>
<td>40</td>
</tr>
<tr>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>95</td>
<td>100</td>
</tr>
<tr>
<td>172</td>
<td>170</td>
</tr>
<tr>
<td>600</td>
<td>600</td>
</tr>
<tr>
<td>999</td>
<td>1000</td>
</tr>
<tr>
<td>1050</td>
<td>1050</td>
</tr>
<tr>
<td>1846</td>
<td>1850</td>
</tr>
</tbody>
</table>

34 min

9  
PbY4a, page 4  
Q.4 Read: Write the meaning of each set label. Write another three numbers in each set.  
Review at BB with whole class. Ask several Ps what they think the labels should be. Ps come to BB to write extra 3 numbers in each set. Class agrees/disagrees.  

Solution:  
<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>420 368 246 716 100 888</td>
</tr>
<tr>
<td></td>
<td>6 78 1098 12 98 1600</td>
</tr>
<tr>
<td>D</td>
<td>235 851 999 111 583 885</td>
</tr>
<tr>
<td></td>
<td>3 57 1003 67 9 1427</td>
</tr>
</tbody>
</table>

A: 3-digit numbers  
B: Not 3-digit numbers  
C: Even numbers  
D: Odd numbers

39 min

Lesson Plan 4

Notes

Whole class activity  
Ps could have number cards on desks too.  
Responses written on scrap paper or slates and shown in unison on command.  
T writes different correct solutions on BB.  
Agreement, praising only

Whole class activity  
T repeats slowly and Ps repeat in own words.  
Give Ps time to think.  
Reasoning, agreement, praising

Individual work, monitored, helped  
Table drawn on BB or use enlarged copy master or OHP  
Discussion, reasoning, agreement, self-correction, praising  
BB:  
5 rounds up to nearest 10  
50 rounds up to nearest 100  
500 rounds up to nearest 1000

Individual work, monitored, helped  
Drawn on BB or use enlarged copy master or OHP  
Discussion, reasoning, agreement, self-correction praising  

Bold numbers have been added.  
Many others are possible – deal with all cases written by Ps.
We could show the table in a different way using a Venn diagram.

BB:

<table>
<thead>
<tr>
<th>A</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-digit numbers</td>
<td>Even numbers</td>
</tr>
</tbody>
</table>

T explains that Natural numbers are all the positive, whole numbers (1, 2, 3, 4, 5, . . .)

Who can explain where the different parts of the table are in the Venn diagram? What do A and C mean? Where are the numbers in D shown? Where would we put the 9 extra numbers? etc.

**Notes**

Whole class activity

Drawn on BB or use enlarged copy master or OHP

(If class is very able, construct the Venn diagram from scratch with Ps' help.)

**Bold** numbers are added.

e.g. 0, – 6, 1 quarter, 3 and a half are not Natural numbers

Ps come to BB to explain, point and write.

Discussion, agreement, praising
<table>
<thead>
<tr>
<th>Y4</th>
<th>Lesson Plan 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity</td>
<td>Notes</td>
</tr>
<tr>
<td>Calculation practice, revision, activities, consolidation</td>
<td></td>
</tr>
<tr>
<td>PbY4a, page 5</td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td>Notes</td>
</tr>
<tr>
<td>----------</td>
<td>-------</td>
</tr>
<tr>
<td><strong>1</strong> Mental practice</td>
<td></td>
</tr>
<tr>
<td>T says an addition, P says sum. If a P makes a mistake, the next P must correct it. e.g. 20 + 90 (= 110), 31 + 50 (= 81), 150 + 400 (= 550), 7 + 16 (= 23), 45 + 47 (= 92), 132 + 68 (= 200), 435 + 435 (= 870), etc.</td>
<td></td>
</tr>
<tr>
<td><strong>5 min</strong></td>
<td></td>
</tr>
<tr>
<td><strong>2</strong> Money models</td>
<td></td>
</tr>
<tr>
<td>a) Let's calculate how much money these two people have altogether. Ps come to BB to write amounts in the place value table, explaining reasoning. Class agrees/disagrees. What should we do before we start the calculation? (Estimate) Ps estimate the total mentally and come to BB to do the calculation, explaining reasoning in detail. Class agrees/disagrees. BB:</td>
<td></td>
</tr>
<tr>
<td>Horizontal methods: 436 + 387 = 700 + 110 + 13 = 823 or 436 + 387 = 736 + 87 = 816 + 7 = 823</td>
<td></td>
</tr>
<tr>
<td>b) Let's calculate how much money Helen had left after she had been shopping. Ps come to BB to write amounts in the place value table, explaining reasoning. Class agrees/disagrees. What should we do before we start the calculation? (Estimate) Ps estimate the total mentally and come to BB to do the calculation, explaining reasoning in detail. Class agrees/disagrees. BB:</td>
<td></td>
</tr>
<tr>
<td>Horizontal method: 843 – 555 = 700 + 130 + 13 – 555 e.g. 700 – 500 + 130 – 50 + 13 – 5 = 200 + 80 + 8 = 288 or mentally: 843 – 555 = 843 – 543 – 12 = 300 – 12 = 288</td>
<td></td>
</tr>
<tr>
<td><strong>13 min</strong></td>
<td></td>
</tr>
</tbody>
</table>

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### Y4

#### Activity

**Problems**

Listen carefully, write the data and do the calculations in your Ex. Bks. Show me the answer when I say.

Ps who respond correctly come to BB to explain reasoning. Who agrees? Who did it another way? Who made a mistake? What kind of mistake? etc.

a) *Gina has £2.35 in her piggy bank and £4.59 in her purse. How much money does she have altogether?*

**BB:**

<table>
<thead>
<tr>
<th></th>
<th>H</th>
<th>T</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>3</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>9</td>
<td>4</td>
</tr>
</tbody>
</table>

**Answer:** Gina has £6.94 altogether.

b) *How much money would Gina have if her father were to put another £2.00 in her piggy bank?*

Show me . . . now! (£8.94)

c) *How much money would Gina have if she took £3.00 from her purse and spent it?*

Show me . . . now! (£3.94)

d) *How much money would Gina have if she took £4.00 out of her purse and put it in her piggy bank?*

Show me . . . now! (£6.94)

---

#### Lesson Plan 6

**Notes**

Individual work in *Ex. Bks* but class kept together, then whole class review

Give Ps time to think and do calculations, then responses shown in unison.

Drawn on BB or use enlarged copy master or OHP

Reasoning, agreement, self-correction, praising

BB: £6.94 + £2.00 = £8.94

(or £4.35 + £4.59 = £8.94)

BB: £6.94 – £3.00 = £3.94

(or £2.35 + £1.59 = £3.94)

There would be no change, as she only moved money from one place to the other.

---

#### PbY4a, page 6

**Q.1** Read: Write your estimation in detail. Calculate the exact sum.

Deal with one part at a time. Review at BB with whole class. Ps give details of calculation. Mistakes discussed and corrected.

**Solution:**

a) 263 + 526

\[
\begin{array}{c}
263 \\
+ 526 \\
\hline 790
\end{array}
\]

b) 354 + 419

\[
\begin{array}{c}
354 \\
+ 419 \\
\hline 773
\end{array}
\]

c) 475 + 53 + 419

\[
\begin{array}{c}
475 \\
+ 53 \\
+ 419 \\
\hline 947
\end{array}
\]

---

Feedback for T
**Lesson Plan 6**

**Notes**

Individual work, monitored, helped

Drawn (or stuck) on BB or use enlarged copy master or OHP

Reasoning, agreement, self-correction, praising

Feedback for T

---

**Y4**

<table>
<thead>
<tr>
<th>Activity</th>
<th>PbY4a, page 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td><strong>PbY4a, page 6</strong></td>
</tr>
<tr>
<td><strong>Q.2</strong></td>
<td>Read: <em>How much money do we have left? Estimate, calculate and check the result.</em></td>
</tr>
<tr>
<td></td>
<td>How much money did we have? (£645) How can we check our calculation? (addition and subtraction) Set a time limit.</td>
</tr>
<tr>
<td></td>
<td>Review at BB with whole class. Ps give details of calculations. Class agrees/disagrees. Mistakes discussed and corrected.</td>
</tr>
<tr>
<td><strong>Solution:</strong></td>
<td>£645</td>
</tr>
<tr>
<td>We had:</td>
<td>100 100 100 20 1 1</td>
</tr>
<tr>
<td>E:</td>
<td>6 5 1 0 – 2 3 0 : 6 4 2 0 2232</td>
</tr>
<tr>
<td>C:</td>
<td>3 2 3 2 2 Check: 4 3 1 3 3 6 4 5 6</td>
</tr>
<tr>
<td>4 1 1 3</td>
<td>2 3 1 2</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>34 min</td>
</tr>
</tbody>
</table>

**Q.3** | Read: *What is the difference between 743 and 558? Estimate, calculate and check the result.* |
| | What kind of operation is it? (subtraction) How can we check it? (addition and subtraction) |
| | Review at BB with whole class. Ps give details of calculations. Who did the same? Who calculated in a different way? Mistakes discussed and corrected. |
| **Solution:** | e.g. 7 4 3 5 5 8 – 18 5 1 0 1 1 8 0 185 |
| E: | 7 4 3 5 5 8 Check: 1 8 5 7 4 3 1 1 8 5 |
| C: | 1 8 5 7 4 3 5 5 8 |
| | Who could write it as an inequality? Who agrees? etc. |
| 38 min |

**Q.4** | Read: *Fill in the missing numbers and write above the dotted and dashed arrows what they mean if the solid arrow means + 180 and the double arrow means – 75.* |
| Ps come to BB to write the operations beside the arrows and to fill in the missing numbers. Ps explaining reasoning in detail. Rest of class check that they are correct. |
| **Solution:** | |
| 4 6 5 + 105 | 5 7 0 + 105 6 7 5 + 105 7 8 0 |
| + 180 | – 75 + 180 | – 75 + 180 – 75 |
| 6 4 5 | 17 5 0 | 8 5 5 |
| | | + 105 |
| | | 9 6 0 |
| If the arrows pointed in the opposite direction, what would they mean? |
| 45 min |

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<table>
<thead>
<tr>
<th>Activity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 Mental practice</strong>&lt;br&gt;T says an operation, Ps say result.&lt;br&gt;a) Addition and subtraction:&lt;br&gt;e.g. 5 + 8, 11 + 7, 38 – 5, 76 + 22, 400 + 500, 680 – 80, 76 + 9,&lt;br&gt;96 – 7, 42 + 49 (= 42 + 40 + 9 = 82 + 9 = 91),&lt;br&gt;64 – 38 (= 64 – 30 – 8 = 34 – 8 = 26), etc.&lt;br&gt;b) Multiplication and division:&lt;br&gt;e.g. 3 × 4, 8 × 7, 6 × 9, 7 × 6, 5 × 20, 81 ÷ 9, 42 ÷ 2,&lt;br&gt;250 ÷ 2, 640 ÷ 80, 50 × 3, 50 × 30, 34 × 10, 450 ÷ 9, etc.</td>
<td>Whole class activity&lt;br&gt;At speed round class (or T chooses Ps at random)&lt;br&gt;If a P makes a mistake, the next P corrects it.&lt;br&gt;If problems, write details of calculation on BB.&lt;br&gt;Reasoning, agreement, praising</td>
</tr>
<tr>
<td><strong>2 Secret number 1</strong>&lt;br&gt;I am thinking of a 2-digit number. I will give you clues and you must tell me what number I could be thinking of.&lt;br&gt;1) <em>The difference between its digits is 3. What number could I be thinking of?</em>&lt;br&gt;Ps write possible numbers in <em>Ex. Bks.</em> Ps dictate numbers to T.&lt;br&gt;BB: 14, 25, 36, 47, 58, 69, 30, 41, 52, 63, 74, 85, 96&lt;br&gt;2) <em>It is also divisible by 6. What number could it be?</em>&lt;br&gt;Ps show possible numbers on command. BB: 30, 36 or 96&lt;br&gt;3) <em>Also, the number in reverse order is divisible by 7.</em>&lt;br&gt;Show me the number . . . now! (36) [63 is divisible by 7]</td>
<td>Whole class activity&lt;br&gt;Give Ps time to think and write.&lt;br&gt;Agreement, praising&lt;br&gt;Responses shown on scrap paper or slates in unison&lt;br&gt;In unison. Praising</td>
</tr>
<tr>
<td><strong>3 Secret number 2</strong>&lt;br&gt;Think of a 1-digit number. Multiply it by 9. If you tell me the units digit of the product, I will tell you the number you first thought of.&lt;br&gt;T asks several Ps for units digits and tells them their original number.&lt;br&gt;e.g. P₁: the units digit of my product is 3. T: your number is 7.&lt;br&gt;P₂: the units digit of my product is 8. T: your number is 2.&lt;br&gt;Who knows how I do it? Ask several Ps what they think. Reason with reference to the 9 times table, e.g. 7 × 9 = 63, 2 × 9 = 18&lt;br&gt;BB: 0, 9, 18, 27, 36, 45, 54, 63, 72, 81&lt;br&gt;0 1 2 3 4 5 6 7 8 9</td>
<td>Whole class activity&lt;br&gt;Ps could stand up when they know how it is done.&lt;br&gt;Let them try too before discussing strategy with the class.&lt;br&gt;Reasoning, agreement, praising</td>
</tr>
<tr>
<td><strong>4 Problems</strong>&lt;br&gt;Listen carefully, write the data and do the calculations in your <em>Ex. Bks.</em> Show me the answer when I say. (On scrap paper or slates)&lt;br&gt;Ps who respond correctly come to BB to explain reasoning. Who agrees? Who did it another way? Who made a mistake? What kind of mistake? etc.&lt;br&gt;a) <em>Dan had £925 in his bank account. He bought a computer for £458. How much does he have left in his account?</em>&lt;br&gt;BB: 925 – 458 = 525 – 58 = 475 – 8 = 467 or&lt;br&gt;Answer: Dan has £467 left.&lt;br&gt;Use this result to help you answer the following questions.</td>
<td>Individual work in <em>Ex. Bks</em>&lt;br&gt;but class kept together, then whole class review&lt;br&gt;Give Ps time to think and do calculations, then responses shown in unison.&lt;br&gt;Reasoning, agreement, self-correction, praising</td>
</tr>
</tbody>
</table>
4 (Continued)

b) How much money would Dan have left if he had £200 less in his account before he bought the computer?
Show me . . . now! (£267) BB: 467 – 200 = 267

c) How much money would Dan have left if he had spent £200 less?
Show me . . . now! (£667) BB: 467 + 200 = 667

d) How much money would Dan have left if he had £300 more in his account before he bought the computer?
Show me . . . now! (£767) BB: 467 + 300 = 767

e) How much money would Dan have left if he had spent £300 more?
Show me . . . now! (£167) BB: 467 – 300 = 167

f) How much money would Dan have left if he had £400 more in his account before he bought the computer and the computer cost £400 more?
Show me . . . now! (£467) BB: 467 + 400 – 400 = 467 or
or 'If you have £400 more but spend £400 more, the amount left stays the same.'

5 PbY4a, page 7

Q.1 Read: Practise addition. Estimate the sum first.
Set a time limit. Remind Ps to check their results mentally by adding in opposite direction and also by comparing with estimate.
Review at BB with whole class. Ps come to BB or dictate to T, explaining reasoning. Mistakes discussed and corrected.
Solution:

a) 263 + 526
   E: 81010
   [263]
   + [526]
   [789]

b) 493 + 174
   E: 70110
   [493]
   + [174]
   [667]

c) 278 + 426
   E: 71010
   [278]
   + [426]
   [704]

Q.2 Read: Practise subtraction. Estimate the difference first.
Check your result in two ways.
Set a time limit. Remind Ps to compare results with estimates.
Review at BB with whole class. Ps come to BB or dictate to T, explaining reasoning in detail. Mistakes discussed and corrected.
Solution:

a) 978 – 523
   E: 46110
   [978]
   – [523]
   [455]
   (C: 552)
   +[552]
   [1106]
   (Check: 4326)
   [978]
   – [552]
   [426]

b) 803 – 576
   E: 22710
   [803]
   – [576]
   [227]
   (C: 576)
   +[576]
   [803]
   (Check: 426)
   [803]
   – [576]
   [227]
### Lesson Plan 7

#### Notes
- Individual work, monitored, helped
- Written on BB or use enlarged copy master or OHP
- Differentiation by time limit (or by task)
- Reasoning, agreement, self-correction, praising
- T helps with details of reasoning where necessary.

#### Activity 7

**PbY3a, page 7**  
**Q.3** Read: Complete the additions and subtractions.

<table>
<thead>
<tr>
<th>a)</th>
<th>b)</th>
<th>c)</th>
<th>d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ 43</td>
<td>+ 25</td>
<td>- 74</td>
<td>+ 48</td>
</tr>
<tr>
<td>107</td>
<td>60</td>
<td>173</td>
<td>65</td>
</tr>
</tbody>
</table>

Set a time limit. Set simpler tasks (without crossing tens) for less able P's if necessary. P's check their results by doing the calculations again mentally.

Review at BB with whole class. P's come to BB to do calculations, explaining reasoning in detail. Class agrees/disagrees. Mistakes discussed and corrected.

Solution:

- a) 163 + 4 = 167
- b) 134 + 757 = 891
- c) 911 - 15 = 896
- d) 1114 - 87 = 1027

#### Activity 8

**PbY3a, page 7, Q.4**  
Read: I thought of a number, then added 900.  
The result was a number less than 1000.

T (or P) reads each statement, then P's show decision on whether true or false by pre-agreed actions (e.g. hands in the air if true or knock on the desk if false) or by writing T or F (or ✗ or ✗) on scrap paper or slates.

- a) The number I first thought of must be less than 100.
  - Show me . . . now! (T) (100 + 900 = 1000)
- b) The number I first thought of must be less than 99.
  - Show me . . . now! (F) (99 + 900 = 999 < 1000)
- c) The number I first thought of could be equal to 99.
  - Show me . . . now! (T)
- d) The number I first thought of cannot be more than 99.
  - Show me . . . now! (T)
- e) The number I first thought of could be equal to 10.
  - Show me . . . now! (T) (10 + 900 = 910 < 1000)
- f) The number I first thought of cannot be 100.
  - Show me . . . now! (T)

Whole class activity  
(or individual trial first if P's wish)

Statements written on BB or SB or OHT (or use enlarged copy master)

P's decide on actions, if used.

Responses shown in unison on command.

P's give examples or counter examples to support their responses (especially incorrect ones!)

In good humour!

Discussion, reasoning, agreement (self-correction in P's if done individually first)

Praising, encouragement only

Feedback for T
Lesson Plan

8

Activity

1 Missing numbers

Study the diagrams. Let's fill in the missing numbers and signs.
Pss come to BB to fill in box, explaining reasoning. Class agrees/disagrees. Calculations can be done alongside BB if necessary.

BB: a) + 20
    455
    + 27
    462
b) – 30
    513
    – 38
    505

[Revision of crossing tens in addition and subtraction]

5 min

2 Competition

T divides class into 2 teams (of roughly equal ability).
T gives a number to each team (e.g. 800 and 650) I will give you
3 minutes to write your number in as many different ways as you can.
Start . . . now! . . . Stop!

Each team checks the other's descriptions. Team with most correct
descriptions is the winner! If both, same, T chooses team with the
most creative descriptions.

e.g. 800 = 135 + 665 = 200 + 600 = 915 – 115 = 400 × 2 =
    1000 – 200 = 1600 ÷ 2 = 2 × 2 × 2 × 10 × 10, etc.

650 = 500 + 150 = 10 × 65 = 1000 – 350 = 5 × 130 =
    1300 ÷ 2 = (76 – 11) × 10 = 12 × 50 + 200 ÷ 4, etc.

10 min

3 Secret number

I am thinking of a number. Try to find out what it is by asking me
questions about it. I can answer only yes or no and your question
must be different from the previous one.

e.g. • Is it more than 1000? No
    • Does it have 3 digits? Yes
    • Is it less than 500? No
    • Does it have an even digit in the hundreds column? Yes
    • Is it more than 700? Yes
    • Is its tens digit less than 5? Yes
    • Is it less than 820? Yes
    • Does it have two digits the same? Yes
    • Is it more than 810? Yes
    • Is it odd? No
    • Is it 818? Yes

15 min

Notes

Whole class activity
Drawn on BB or use enlarged
copy master or OHP

At a good pace
Reasoning, agreement,
praising
Calculations, e.g.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>2</td>
</tr>
</tbody>
</table>

Whole class activity
BB divided into two parts (or
numbers written on SBs or
large sheets of paper on
different walls of classroom

Ps from each team come to
BB one after the other.

At speed
Rest of team check their
responses for repeats or
incorrect descriptions.
Class applauds the winner!

Whole class activity
T chooses Ps at random to
ask a question.

Encourage Ps to ask logical
questions and to keep in mind
clues already found out from
previous questions.

Ps can make notes in Ex. Bks.

At a good pace
Extra praise for clever
questions

Repeat with another number
if time (or P comes to front
to think of a number and to
answer questions.)
Activity

4  PBY4a, page 8

Q.1 Read: The sum of any two adjacent numbers is the number directly above them. Fill in the missing numbers.

Set a time limit. Review at BB with whole class. Ps come to BB to fill in numbers or dictate to T, explaining reasoning. Class agrees/disagrees. Mistakes corrected.

Solution:

<table>
<thead>
<tr>
<th>a)</th>
<th>1000</th>
<th>615</th>
<th>385</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>325</td>
<td>290</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>90</td>
<td>235</td>
<td>55</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>b)</th>
<th>2000</th>
<th>600</th>
<th>1400</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>200</td>
<td>400</td>
<td>1000</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>200</td>
<td>200</td>
</tr>
</tbody>
</table>

Q.2 Read: Fill in the missing numbers.

Make sure Ps know that equations must be true both horizontally and vertically. Encourage Ps to calculate mentally and to check their results. Set a time limit.

Review at BB with whole class. Ps come to BB or dictate to T, explaining reasoning. Mistakes discussed and corrected.

Solution:

<table>
<thead>
<tr>
<th>a)</th>
<th>30 + 120 + 120 = 270</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>200 + 150 - 130 = 220</td>
</tr>
<tr>
<td></td>
<td>110 + 30 + 110 = 250</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>b)</th>
<th>260 - 120 + 50 = 190</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>110 + 150 - 100 = 160</td>
</tr>
<tr>
<td></td>
<td>200 + 230 - 10 = 220</td>
</tr>
</tbody>
</table>

Q.3 Read: Do the additions and subtractions. Look for connections between them.

Encourage Ps to do calculations mentally. Set a time limit.

Review at BB with whole class. Ps dictate results to T or come to BB. Mistakes discussed and corrected.

Solution:

<table>
<thead>
<tr>
<th>a)</th>
<th>25 + 40 = 65</th>
<th>725 + 40 = 765</th>
<th>725 + 140 = 865</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>65</td>
<td>190</td>
<td>515</td>
</tr>
<tr>
<td></td>
<td>58 - 40 = 18</td>
<td>658 - 40 = 618</td>
<td>658 - 240 = 418</td>
</tr>
<tr>
<td></td>
<td>60 + 17 = 77</td>
<td>60 + 317 = 377</td>
<td>460 + 317 = 777</td>
</tr>
<tr>
<td></td>
<td>93 - 63 = 30</td>
<td>393 - 63 = 330</td>
<td>393 - 363 = 30</td>
</tr>
</tbody>
</table>

What did you notice about them? (e.g. if one of the terms is increased by a certain amount, then the sum will also increase by that amount; if the number being subtracted (subtrahend) is increased by a certain amount, then the difference will decrease by that amount, etc.)

Lesson Plan 8

Notes

Individual work, monitored, helped

Drawn on BB or use enlarged copy master or OHP

Calculations done in Ex. Bks or on slates if necessary.

Reasoning, agreement, self-correction, praising

At a good pace

Bold numbers are given.

Individual work, monitored, (helped)

Written on BB or use enlarged copy master or OHP

Differentiation by time limit

Discussion, agreement, self-correction, praising

Feedback for T

Individual work, monitored, (helped)

Written on BB or use enlarged copy master or OHP

Agreement, self-correction, praising

Feedback for T

Whole class discussion

Involve several Ps. Ps come to BB to point and explain.

Praise all contributions.

T repeats Ps' explanations more clearly if necessary.
**Lesson Plan 8**

**Notes**

Individual work, monitored, helped, but class kept together on questions

Discussion, reasoning, agreement, self-correction, praising

Keep up a good pace throughout

Feedback for T

or

BB: 348 + 316 = 648 + 16

= 664

or use subtraction

or G < B

43

Check:

e.g.  

\[
\begin{array}{c}
2 \\
+ \\
188 \\
\hline
188 \\
\end{array}
\]

\[
\begin{array}{c}
4 \\
+ \\
177 \\
\hline
1 \checkmark
\end{array}
\]

or use subtraction

Agree that Eve coming second is not important.

or G < B

109

Check by adding in opposite direction.

or

\[
\begin{array}{c}
234 \\
+ \\
34 \\
\hline
268 \\
\end{array}
\]

\[
\begin{array}{c}
2 \\
+ \\
343 \\
\hline
345 \\
\end{array}
\]

or

\[
\begin{array}{c}
3 \\
+ \\
109 \\
\hline
4 \checkmark
\end{array}
\]
### Activity 7

<table>
<thead>
<tr>
<th>Y4</th>
<th>Lesson Plan 8</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Activity</strong></td>
<td><strong>Notes</strong></td>
</tr>
<tr>
<td>(Continued)</td>
<td></td>
</tr>
<tr>
<td>e) One morning there were <strong>664 children</strong> on the beach. <strong>385</strong> of them went home for lunch. How many children remained on the beach?</td>
<td></td>
</tr>
<tr>
<td>Children remaining: 664 – 385</td>
<td></td>
</tr>
<tr>
<td><em>Estimation</em>: 700 – 400 = 300 or 660 – 390 = 260 + 10 = 270</td>
<td></td>
</tr>
<tr>
<td><em>Answer</em>: 279 children remained on the beach.</td>
<td></td>
</tr>
<tr>
<td>Stand up if you had all 5 problems correct. Let's give them a round of applause!</td>
<td></td>
</tr>
<tr>
<td><strong>45 min</strong></td>
<td></td>
</tr>
</tbody>
</table>
Activity

1 Multiplication practice
Let's practise the multiplication table. Ps say whole equation.

1 \times 0 = 0, 1 \times 1 = 1, 1 \times 2 = 2, \ldots 1 \times 10 = 10, \ldots (1 \times 11, \ldots)
2 \times 0 = 0, 2 \times 1 = 2, 2 \times 2 = 4, \ldots 2 \times 10 = 20, \ldots (2 \times 11, \ldots)
3 \times 0 = 0, 3 \times 1 = 3, 3 \times 2 = 6, \ldots 3 \times 10 = 30, \ldots (3 \times 11, \ldots)
\ldots
10 \times 0 = 0, 10 \times 1 = 10, 10 \times 2 = 20, \ldots 10 \times 10 = 10 (10 \times 11, \ldots)

5 min

2 Division practice
Let's practise the division table. T says a division, Ps say quotient.

0 \div 0 = \text{impossible}, 1 \div 0 = \text{impossible}
1 \div 0 = 1, 1 \div 1 = 1, 1 \div 2 = 2, \ldots 10 \div 1 = 10, (157 \div 1 = 157)
0 \div 2 = 0, 2 \div 2 = 1, 4 \div 2 = 2, 6 \div 2 = 3, 8 \div 2 = 4,
10 \div 2 = 5, \ldots 20 \div 2 = 10, (68 \div 2 = 34, 1 \div 2 = \frac{1}{2}, 7 \div 2 = 3 \frac{1}{2})
0 \div 3 = 0, 3 \div 3 = 1, 6 \div 3 = 2, 9 \div 3 = 3, \ldots 30 \div 3 = 10,
(33 \div 3 = 11, 36 \div 3 = 12, 150 \div 3 = 50, 960 \div 3 = 320, 2 \div 3 = \frac{2}{3},
50 \div 3 = 16 \div 3 + 2 \div 3 = 16 + \frac{2}{3} = 16\frac{2}{3})
\ldots
0 \div 10 = 0, 10 \div 10 = 1, 20 \div 10 = 2, \ldots, 100 \div 10 = 10,
(1500 \div 10 = 150, 1320 \div 10 = 132, 672 \div 10 = 67 + \frac{2}{10} = 67\frac{2}{10} = 67.2)

10 min

3 Order of operations
Let's see how clever you are at doing calculations! Ps come to BB to do calculations in correct order, explaining reasoning in detail. Other Ps point out errors or suggest easier ways of calculating.

BB:

a) 89 + 45 – 28  =  (106) b) 197 – 54 + 28  =  (171)
89 + (45 – 28)  =  (106) 197 – (54 + 28)  =  (115)
(89 + 45) – 28  =  (106) (197 – 54) + 28  =  (171)

(89 + 45) – 28  =  (106) (197 – 54) + 28  =  (171)

(89 + 45) – 28  =  (106) (197 – 54) + 28  =  (171)

(360 \div 4 \times 2 = 180) d) 120 \times 8 \div 4 = (240)
360 \div (4 \times 2) = (45) 120 \times (8 \div 4) = (240)
(360 \div 4) \times 2 = (180) (120 \times 8) \div 4 = (240)

20 min

4 PbY4a, page 9
Q.1 Read: Complete the table using the rule given.
Set a time limit. Encourage mental calculation.

Drawn on BB or use enlarged copy master or OHP

Individual work, monitored, helped

Reasoning, agreement, self-correction, praising

Solution:

<table>
<thead>
<tr>
<th></th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
<th>f</th>
<th>g</th>
<th>h</th>
<th>i</th>
<th>j</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>648</td>
<td>563</td>
<td>437</td>
<td>343</td>
<td>847</td>
<td>358</td>
<td>1345</td>
<td>734</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>342</td>
<td>204</td>
<td>548</td>
<td>285</td>
<td>51</td>
<td>561</td>
<td>284</td>
<td>814</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a + b</td>
<td>990</td>
<td>767</td>
<td>985</td>
<td>628</td>
<td>898</td>
<td>919</td>
<td>1629</td>
<td>1548</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Lesson Plan 9**

### Activity

#### 5

**PbY4a, page 9**

Q.2 Read: Complete the table using the rule given.

Set a time limit. Calculations written in Ex. Bks. if necessary. Review at BB with whole class. Ps come to BB or dictate to T, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected.

**Solution:**

<table>
<thead>
<tr>
<th>x</th>
<th>674</th>
<th>452</th>
<th>548</th>
<th>343</th>
<th>847</th>
<th>919</th>
<th>1629</th>
<th>1548</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>261</td>
<td>309</td>
<td>437</td>
<td>285</td>
<td>51</td>
<td>561</td>
<td>1345</td>
<td>734</td>
</tr>
<tr>
<td>x − y</td>
<td>413</td>
<td>143</td>
<td>111</td>
<td>58</td>
<td>796</td>
<td>358</td>
<td>284</td>
<td>814</td>
</tr>
</tbody>
</table>

#### 6

**PbY3b, page 9**

Q.3 Read: Draw arrows pointing towards the multiples.

Tell me a multiple of 3 (5, 8, 10, 100). Elicit that a multiple of a number is exactly divisible by that number, or is the result of multiplying that number by another number.

What has 30 been multiplied by to result in 60? (30 × 2 = 60)

Ps draw arrows in Pbs. Review at BB with whole class. Ps come to BB draw arrows or dictate where T should draw them. Class agrees/disagrees. Mistakes corrected.

**Solution:**

Ps might not have shown that 40 is a multiple of 40, etc.

Remind Ps that, e.g. the multiples of 3 are:

0, 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, . . .

because 0 times and 1 times a number result in the multiples 0 and the number itself, i.e. 0 × 3 = 0 and 1 × 3 = 3.

If the arrows pointed in the opposite direction, what would they show? (They would point towards a factor of the number.)

e.g. 30 is a factor of 60 because 30 × 2 = 60.

Elicit that a factor of a certain number divides into that number exactly, or multiplies another number to make that certain number.

What other numbers are factors of 60? (3 × 20, 5 × 12, 6 × 10, 4 × 15, 60 × 1) Is 0 a factor of 60? (No, because it is impossible to divide by 0, or because 0 × another number ≠ 60. 0 can only be a multiple of 60: 0 × 60 = 0)

What special name do we give natural numbers which have only 1 and the number itself as factors? (prime numbers)

Who can tell me a prime number? T writes what Ps dictate. Class agrees/disagrees.

### Notes

Individual work, monitored, helped

Drawn on BB or use enlarged copy master or OHP

Differentiation by time limit

Encourage Ps to do easy calculations mentally.

Reasoning, agreement, self-correction, praising

**Extension**

Ps add other columns to table.

---

**Lesson Plan 9**

### Notes

Individual work, monitored, helped

Written on BB or use enlarged copy master or OHP

Revision of what a multiple is.

Ps tell what they know. T repeats clearly if necessary.

Discussion, reasoning, agreement, self-correction, praising

**Extension**

What special name do we give natural numbers which have only 1 and the number itself as factors? (prime numbers)

Who can tell me a prime number? T writes what Ps dictate. Class agrees/disagrees.

---

Whole class discussion

**BB:** Multiples of a natural number always include 0 and the number itself.

Whole class discussion

Allow Ps to tell what they know. T repeats more clearly if necessary.

**BB:** Factors of a natural number always include 1 and the number itself, but never 0!

**BB:** Prime numbers

e.g. 1, 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, . . .

Agreement, praising
Q.4 Read: Underline the important data. Write a plan, estimate, calculate and check your result. Write the answer in a sentence. Do the work in your exercise book.

Deal with one part at a time. Set a time limit. Ps read question themselves and solve it in Ex. Bks. Make sure that you do not miss a step! Ps sit up with arms folded when finished.

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

Solution:

a) Ann has £716 and Barry has £285 less. How much money does Barry have? How much money do Ann and Barry have altogether?


\[
\begin{array}{c}
716 \\
-285 \\
\hline
431
\end{array}
\]

Estimation: e.g. 700 – 300 = 400

Answer: Barry has £431.

ii) Plan: A + B: £716 + £431

\[
\begin{array}{c}
716 \\
+431 \\
\hline
1147
\end{array}
\]

Estimation: e.g. 720 + 430 = 1150

Answer: Ann and Barry have £1147 altogether.

b) Ann has £716 and Sarah has £285 more. How much money does Sarah have? How much money do Ann and Sarah have altogether?

i) Plan: A: £716, S: £716 + £285

\[
\begin{array}{c}
716 \\
+285 \\
\hline
1001
\end{array}
\]

Estimation: e.g. 700 + 300 = 1000

Answer: Sarah has £1001.

ii) Plan: A + S: £716 + £1001

\[
\begin{array}{c}
716 \\
+1001 \\
\hline
1717
\end{array}
\]

Estimation: e.g. 720 + 1000 = 1720

Answer: Ann and Sarah have £1717 altogether.

c) Ann has £716, which is £285 less than Tom has. How much does Tom have? How much do Ann and Tom have altogether?

i) Plan: A: £716, T: £716 + £285 = £1001 (from b)

Answer: Tom has £1001.

ii) Plan: A + T: £716 + £1001 = £1717 (from b)

Answer: Ann and Tom have £1717 altogether.

d) Ann has £716, which is £285 more than Suzy has. How much does Suzy have? How much do Ann and Suzy have altogether?


Answer: Suzy has £431.

ii) Plan: A + S: £716 + £431 = £1147 (from a)

Answer: Ann and Suzy have £1147 altogether.

Notes

Individual work, monitored, helped. Class kept together for a) and b), then differentiation by time limit.

Only the most able Ps will have time to finish all the questions individually. If no P finishes in the set time, e) can be done at home if Ps wish and reviewed in Lesson 10, or done with the whole class.

Discussion, reasoning, agreement, self-correction, praising

Keep up a good pace throughout.

Check with addition or subtraction

or \[716 \times 2 – 285 = 1432 – 285\]

\[
\begin{array}{c}
1432 \\
-285 \\
\hline
1147
\end{array}
\]

Check with addition in opposite direction

or \[716 \times 2 + 285\]

\[
\begin{array}{c}
716 \\
+285 \\
\hline
1001
\end{array}
\]

Extra praise if Ps notice similarity to b)

Extra praise if Ps notice similarity to a)
### Y4

**Activity**

#### Lesson Plan 9

<table>
<thead>
<tr>
<th>Week 2</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>7</th>
<th>(Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>e) Ted has £761 and Sam has £285. How much money should Ted give to Sam so that they both have the same amount?</td>
<td></td>
</tr>
<tr>
<td><strong>Plan:</strong> T: £761, S: £285 Difference: £761 – £285</td>
<td></td>
</tr>
<tr>
<td>The point where they both have the same amount will be half way between 761 and 285. (Show on a diagram on BB.)</td>
<td></td>
</tr>
<tr>
<td>Mid-point: ( (761 - 285) \div 2 = 476 \div 2 = \frac{476}{2} = 238 )</td>
<td></td>
</tr>
<tr>
<td>Details: ( 476 \div 2 = 400 \div 2 + 60 \div 2 + 16 \div 2 = 200 + 30 + 8 = 238 )</td>
<td></td>
</tr>
<tr>
<td><strong>Answer:</strong> Ted should give £238 to Sam and they will both have £523.</td>
<td></td>
</tr>
</tbody>
</table>

Stand up if you had all 5 problems correct. (Much deserved applause!)

### 8

**PbY4a, page 9.**

Q.5 Read: **Fill in the missing digits.**

Set a time limit. Ps check by doing calculation again mentally.

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

**Solution:**

<table>
<thead>
<tr>
<th>a)</th>
<th>1143</th>
<th>b)</th>
<th>1156</th>
<th>c)</th>
<th>973</th>
<th>d)</th>
<th>807</th>
</tr>
</thead>
<tbody>
<tr>
<td>+8</td>
<td>109</td>
<td>+8</td>
<td>67</td>
<td>-5</td>
<td>61</td>
<td>-5</td>
<td>34</td>
</tr>
<tr>
<td>7</td>
<td>32</td>
<td>1</td>
<td>023</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>73</td>
</tr>
</tbody>
</table>

Reasoning, agreement, self-correction, praising

---

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Tables practice, revision, activities consolidation

*Practice Book Y4a, page 10*

**Solutions:**

1. a) $653 + 25 = 678$  
b) $200 - 25 = 175$  
c) $109 + 9 = 118$
   
   $394 + 37 = 431$  
   $645 - 40 = 605$  
   $376 + 33 = 409$
   
   $116 + 93 = 209$  
   $2000 + 11 = 2011$  
   $725 + 108 = 833$  
   $1010 + 29 = 1039$  
   $900 - 542 = 358$  
   $853 - 54 = 799$  
   $376 + 33 = 409$
   
   $725 + 108 = 833$  
   $1010 + 29 = 1039$  
   $900 - 542 = 358$  
   $853 - 54 = 799$  
   $2000 + 11 = 2011$  
   $1010 + 29 = 1039$  
   $376 + 33 = 409$

2. a) $654 + 59 + 9 = 722$
   
   b) $866 - 40 - 7 = 821$
   
   $826 - 347 = 479$

3. a) $40 \times 3 = 120$  
b) $70 \times 7 = 490$  
c) $20 \times 8 = 160$
   
   $2 \times 70 = 140$  
   $3 \times 90 = 270$  
   $400 \times 0 = 0$
   
   $61 \times 8 = 488$  
   $26 \times 4 = 104$  
   $30 \times 10 = 300$
   
   $25 \times 6 = 150$  
   $91 \times 9 = 819$  
   $100 \times 10 = 1000$
   
   $17 \times 4 = 68$  
   $85 \times 5 = 425$  
   $110 \times 11 = 1210$

4.  

<table>
<thead>
<tr>
<th></th>
<th>[840]</th>
<th>[360]</th>
<th>[690]</th>
<th>[1224]</th>
<th>[749]</th>
<th>[816]</th>
<th>[1535]</th>
<th>[0]</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>20</td>
<td>10</td>
<td>30</td>
<td>12</td>
<td>7</td>
<td>1</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>c</td>
<td>42</td>
<td>36</td>
<td>23</td>
<td>102</td>
<td>107</td>
<td>816</td>
<td>307</td>
<td>0</td>
</tr>
</tbody>
</table>

\[a = b \times c\]  
\[b = a \div c\]  
\[c = a + b\]

5. Gave to friends: $6 \times 15$ (sweets)  
Had left: 25 sweets
   
In box: $6 \times 15 + 25 = 90 + 25 = 115$ (sweets)
**Activity**

1. **Sequences**
   T says the first few terms of a sequence and Ps continue it. What is the rule?
   a) 0, 7, 14, (21, 28, 35, 42, 49, 56, 63, 70, 77, 84, ...)
      *Rule:* + 7 (or multiples of 7 in increasing order)
   b) 0, –4, 4, –8, 8, –12, 12, (–16, 16, –20, 20, –24, 24, ...)
      *Rule:* Negative, then corresponding positive, multiples of 4.
   c) ..., –24, –16, –8, 0, 8, 16, (24, 32, 40, 48, 56, 64, 72, ...)
      *Rule:* + 8 (or whole multiples of 8 in increasing order)
   d) 11, 22, 33, (44, 55, 66, 77, 88, 99, 110, 121, 132, 143, ...)
      *Rule:* + 11 (or natural multiples of 11 in increasing order)

2. **Multiplication table relay**
   T says a multiplication, e.g. '3 × 4', P₁ says result ('= 12'), then says a multiplication for P₂, e.g. '7 × 6'; P₂ says result ('= 42'), then says a multiplication for P₃, e.g. '5 × 9', P₃ says result ('= 45'), etc.
   Ps may have multiplication table on desks if they wish. T notes the Ps who use it. Class points out errors if next P misses it.

3. **Division table relay**
   T says a division, e.g. '8 ÷ 4', P₁ says result ('= 2'), then says a division for P₂, e.g. '15 ÷ 5'; P₂ says result ('= 3'), then says a division for P₃, e.g. '28 ÷ 7', P₃ says result ('= 4'), etc.
   If there is a remainder, Ps must solve it but T states that it was not a correct question. Class points out errors if next P misses it.

4. **Writing operations**
   Study the diagrams. Who can write additions or multiplications or divisions about them? Ps come to BB or dictate what T should write.
   BB:
   ```
   100 100 100 100  
   100 100 100 100  
   100 100 100 100  
   100 100 100 100  
   50 50 50 50 50  
   50 50 50 50 50  
   50 50 50 50 50  
   e.g. 400 + 400 + 400 = 1200  e.g. 250 + 250 + 250 + 250 = 1000
   300 + 300 + 300 + 300 = 1200  200 + 200 + 200 + 200 + 200 = 1000
   600 + 600 = 1200  etc.  500 + 500 = 1000  etc.
   400 × 3 = 1200  250 × 4 = 1000
   300 × 4 = 1200  200 × 5 = 1000
   600 × 2 = 1200  etc.  500 × 2 = 1000  etc.
   1200 ÷ 100 = 12  1000 ÷ 50 = 20
   1200 ÷ 200 = 6  1000 ÷ 100 = 10
   1200 ÷ 300 = 4  etc.  1000 ÷ 200 = 5  etc.
   ```

**Notes**

Week 3

**Lesson Plan**

11

**R:** Mental and written calculation

**C:** Multiplication and division tables

**E:** Numbers up to 2000

<table>
<thead>
<tr>
<th>Activity</th>
<th>Notes</th>
</tr>
</thead>
</table>
| 1. **Sequences** | Whole class activity
  At speed in order round class
  Discussion on the rule.
  Talk about the different kinds of numbers:
  - Natural numbers: positive whole numbers (1, 2, 3, ...)
  - Negative numbers: \( n < 0 \)
  - Positive numbers: \( n > 0 \)
  - Fraction: part of 1 unit
  Praising, encouragement only

| 2. **Multiplication table relay** | Whole class activity
  At speed in order round class
  If a P makes a mistake, next P corrects it quickly and says the next multiplication.
  In good humour!

| 3. **Division table relay** | Whole class activity
  At speed in order round class
  If a P makes a mistake, next P corrects it quickly and says the next division.
  In good humour!

| 4. **Writing operations** | Whole class activity
  Model money stuck or drawn on BB or use enlarged copy master or OHP
  At a good pace
  Agreement, praising
  Extra praise for unexpected operations, e.g.
  \( 50 \times 10 \times 2 = 1000 \)
**Lesson Plan 11**

**Activity**

5  
_PbY4a, page 11_

Q.1 Read: *Calculate the products. Look for relationships.*

Set a time limit. Encourage mental calculation.

Review at BB with whole class. Ps dictate results to T. Class agrees/disagrees. Mistakes discussed and corrected.

_Solution:_

<table>
<thead>
<tr>
<th>a) 4 × 5 = 20</th>
<th>b) 3 × 6 = 18</th>
<th>c) 4 × 4 = 16</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 × 5 = 200</td>
<td>30 × 6 = 180</td>
<td>40 × 4 = 160</td>
</tr>
<tr>
<td>4 × 50 = 200</td>
<td>3 × 60 = 180</td>
<td>4 × 10 = 40</td>
</tr>
</tbody>
</table>

Ps tell class what relationships they noticed. (e.g. if one of the factors increases by 10 times, the product increases by 10 times; if both factors increase by 10 times, the product increases by 10 × 10 = 100 times, etc.)

27 min

6  
_PbY4a, page 11_

Q.2 Read: *Calculate the quotients. Look for relationships.*

Set a time limit. Encourage mental calculation.

Review at BB with whole class. Ps dictate results to T. Class agrees/disagrees. Mistakes discussed and corrected.

_Solution:_

<table>
<thead>
<tr>
<th>a) 12 ÷ 4 = 3</th>
<th>b) 20 ÷ 5 = 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>120 ÷ 4 = 30</td>
<td>200 ÷ 5 = 40</td>
</tr>
<tr>
<td>1200 ÷ 400 = 3</td>
<td>2000 ÷ 500 = 4</td>
</tr>
</tbody>
</table>

Ps tell class what relationships they noticed. (e.g. if the dividend increases by 10 times, the quotient also increases by 10 times; if the divisor increases by 10 times, the quotient decreases by 1 tenth, etc.)

32 min

7  
_PbY4a, page 11_

Q.3 Read: *Calculate the products. Look for relationships.*

Set a time limit. Ps can write calculations in _Ex. Bks_ if necessary.

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

_Solution:_

<table>
<thead>
<tr>
<th>a) 3 × 100 = 300</th>
<th>b) 100 × 7 = 700</th>
<th>c) 200 × 4 = 800</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 × 40 = 120</td>
<td>30 × 7 = 210</td>
<td>80 × 4 = 320</td>
</tr>
<tr>
<td>3 × 140 = 420</td>
<td>130 × 7 = 910</td>
<td>280 × 4 = 1120</td>
</tr>
</tbody>
</table>

Use this idea to help you do some of the next multiplications.

Individual work, monitored, helped
Written on BB or SB or OHT (or T has BB already prepared and uncovers results as they are dealt with)
Reasoning, agreement, self-correction, praising
Feedback for T

Involve several Ps.
T repeats Ps' reasoning in a clearer way if necessary.
Praise all contributions.

Individual work, monitored, helped
Written on BB or SB or OHT (or T has BB already prepared and uncovers results as they are dealt with)
Reasoning, agreement, self-correction, praising
Feedback for T

Involve several Ps.
T repeats Ps' reasoning in a clearer way if necessary.
Praise all contributions.

Individual work, monitored, helped
Written on BB or SB or OHT (or T has BB already prepared and uncovers results as they are dealt with)
Reasoning, agreement, self-correction, praising
Ps relate what they notice.
(Bottom row is the sum of the other two rows)
Lesson Plan 11

Notes

If problems, write details on BB, e.g.

\[ 6 \times 13 = 6 \times 10 + 6 \times 3 = 60 + 18 = 78 \]
\[ 7 \times 140 = 7 \times 100 + 7 \times 40 = 700 + 280 = 980 \]

Individual work, monitored, helped
Discussion, reasoning, agreement, self-correction, praising
Accept any correct method.
E.g.

a) \[ 30 \times 28 = 3 \times 10 \times 28 = 3 \times 280 = 600 + 240 = 840 \]
b) \[ 8 \times 190 = 8 \times 200 - 8 \times 10 = 1600 - 80 = 1520 \]

Feedback for T

Individual work in writing plans, but reviewed with whole class.
Reasoning, agreement, self-correction in Pbs, praising
Elicit that 120 kg is divided into 6 equal parts and that each child will get 1 sixth.

It can be thought of as:

’How many 30 kg are in 900 kg?’ or ’How many times does 30 kg go into 900 kg?’

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### Lesson Plan 12

**Y4**

**R:** Mental calculation. Multiplication and division tables  
**C:** Multiplication, division. Addition, subtraction up to 1000  
**E:** Up to 2000

<table>
<thead>
<tr>
<th>Activity 1</th>
</tr>
</thead>
</table>
| **PbY4a, page 12**  
Q.1 Read: *Fill in the numbers which are missing from the multiplication table.*  
Set a time limit. Less able Ps may have printed tables to help them.  
Review at BB with whole class. Ps dictate what T should write. Class agrees/disagrees. Mistakes corrected.  
Find these sequences in the table and continue them. What is the rule? Who agrees? Who thinks something else?  

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
| a) 0, 8, 18, 30, (44, 60, 78, 98, 120, . . .)  
8, 10, 12, 14, 16, 18, 20, 22, 24, . . .  
**Rule:** Difference starts at 8 and increases by 2 (or \( 0 \times 7, 1 \times 8, 2 \times 9, 3 \times 10, 4 \times 11, 5 \times 12, \ldots \)) |  |
| b) 0, 5, 12, 21, 32, (45, 60, 77, 96, 117, . . .)  
5, 7, 9, 11, 13, 15, 17, 19, 21, . . .  
**Rule:** Difference starts at 5 and increases by 2 (or \( 0 \times 4, 1 \times 5, 2 \times 6, 3 \times 7, 4 \times 8, 5 \times 9, 6 \times 10, \ldots \)) |  |
| c) 0, 2, 6, 12, 20, 30, (42, 56, 72, 90, 110, 132, . . .)  
2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, . . .  
**Rule:** Difference starts at 2 and increases by 2 (or \( 0 \times 1, 1 \times 2, 2 \times 3, 3 \times 4, 4 \times 5, 5 \times 6, 6 \times 7, \ldots \)) |  |
| d) 0, 1, 4, 9, 16, (25, 36, 49, 64, 81, 100, 121, 144, . . .)  
1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, . . .  
**Rule:** Difference starts at 1 and increases by 2 (or \( 0 \times 0, 1 \times 1, 2 \times 2, 3 \times 3, 4 \times 4, 5 \times 5, 6 \times 6, \ldots \)) |  |
|   | 10 min |

**Extension**

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
</table>
| **Order of operations**  
Copy these operations in your *Ex. Bks* and do them in the correct order BB:  
a) \( 6 \times 30 + 40 = (220) \)  
b) \( 3 \times 60 - 40 = (140) \)  
c) \( 60 \times 2 - 25 = (95) \)  
d) \( 70 + 80 \div 4 = (90) \)  
e) \( 90 + 150 \div 3 = (140) \)  
f) \( 200 - 300 \div 6 = (150) \)  
Set a time limit. Review at BB with whole class. Mistakes discussed and corrected. Revise order of operations if necessary. |  |
|   | 15 min |

**Notes**

Individual work, monitored  
Drawn on BB or use enlarged copy master or OHP (or *OHT 14*)  
Agreement, self-correction, praising if no mistakes  
Feedback for T  
T says first few terms, also writing them on the BB.  
Ps continue sequence in order round class (or T chooses Ps at random).  
Ps come to multiplication table on BB or OHT to point to terms.  
Discussion on the rule.  
T writes differences below terms on BB.  
Agreement, differences below terms on BB.  
**d) Elicit or remind Ps that these numbers are square numbers** i.e., they can form a square, e.g.  
\( 3 \)  
<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
</table>
| **Individual work, monitored**  
Written on BB or SB or OHT  
Ps come to BB to write result of operation to be done first, then to write the answer, explaining reasoning. Class agrees/disagrees.  
Reasoning, agreement, self-correction, praising  
Feedback for T |  |
Lesson Plan 12

### Activity

#### 3

**Missing numbers**

Who can fill in the missing numbers? Ps come to BB to write and explain reasoning with inverse operation. e.g. ‘7 times 6 = 42, because 42 divided by 6 = 7’.

BB:

- a) $0 \times 5 = 0$
- b) $10 \times 7 = 70$
- c) $7 \times 6 = 42$
- d) $7 \times 8 = 56$
- e) $8 \times 1 = 8$
- f) $1 \times 9 = 9$
- g) $7 \times 7 = 49$
- h) $9 \times 8 = 72$
- i) $18 \div 3 = 6$
- j) $35 \div 5 = 7$
- k) $25 \div 5 = 5$
- l) $0 \div 8 = 0$
- m) $54 \div 9 = 6$
- n) $48 \div 8 = 6$
- o) $27 \div 9 = 3$
- p) $\not{\div} 0 \neq 5$

**BB:**

- **20 min**

#### 4

**Division practice**

Let’s do these divisions. Ps come to BB in pairs, one P to write quotients and remainders and the other to check with multiplication and addition. Class points out errors.

BB:

- a) $17 \div 4 = (4, r 1)$
- b) $23 \div 2 = (11, r 1)$
- c) $23 \div 5 = (4, r 3)$
- d) $27 \div 7 = (3, r 6)$
- e) $40 \div 6 = (6, r 4)$
- f) $28 \div 2 = (14) \text{ (no remainder)}$
- g) $40 \div 6 + 4 = 40$
- h) $28 \div 2 = (14) \text{ (no remainder)}$
- i) $85 \div 5 = (17) \text{ (no remainder)}$
- j) $75 \div 9 = (8, r 3)$
- k) $17 \times 5 = 85$
- l) $8 \times 9 + 3 = 75$

**BB:**

- **20 min**

#### 5

**PbY4a, page 12**

Q.2 Read: *Do the calculations in the correct order.*

Set a time limit. Ps write result above the first calculation to be done or keep it in mind before writing final result.

Review at BB with whole class. Ps come to BB or dictate to T. Mistakes discussed and corrected.

What did you notice? e.g. $(60 + 20) \times 2 = 60 \times 2 + 20 \times 2$

**Solution:**

- a) $60 + 20 \times 2 = 100$
- b) $15 + 30 \div 3 = 25$
- $80 \times 2 = 160$
- $15 + 30 \div 3 = 25$
- $60 \times 2 + 20 = 140$
- $15 \div 3 + 30 = 35$
- $60 \times 2 + 20 \times 2 = 160$
- $15 \div 3 + 30 \div 3 = 15$

**BB:**

- **30 min**

Notes

- Whole class activity
- Written on BB or use enlarged copy master or OHP
- At a good pace
- Reasoning, agreement, praising

- Whole class activity
- *Ex. Bks* if Ps wish
- Written on BB or SB or OHT
- At a good pace
- Reasoning, agreement, checking, praising
- Details written on BB if problems, e.g. $85 \div 5 = 50 \div 5 + 35 \div 5$
- Feedback for T

- Individual work, monitored, helped
- Written on BB or SB or OHT
- Reasoning, agreement, self-correction, praising.
- Extra praise if Ps notice and explain equal results without help from T.
PbY4a, page 12

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

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

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

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

Solution:

<table>
<thead>
<tr>
<th></th>
<th>a</th>
<th>4</th>
<th>150</th>
<th>632</th>
<th>111</th>
<th>604</th>
<th>354</th>
<th>704</th>
<th>635</th>
<th>246</th>
<th>362</th>
</tr>
</thead>
<tbody>
<tr>
<td>b</td>
<td>354</td>
<td>500</td>
<td>982</td>
<td>461</td>
<td>954</td>
<td>704</td>
<td>1054</td>
<td>985</td>
<td>596</td>
<td>712</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>x</th>
<th>20</th>
<th>15</th>
<th>200</th>
<th>111</th>
<th>50</th>
<th>180</th>
<th>150</th>
<th>99</th>
<th>120</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>140</td>
<td>105</td>
<td>1400</td>
<td>777</td>
<td>350</td>
<td>1260</td>
<td>1050</td>
<td>693</td>
<td>840</td>
<td>700</td>
<td></td>
</tr>
<tr>
<td>x = y ÷ 7, y = x × 7, Ext: y ÷ x = 7, (x ÷ y = (\frac{1}{7}))</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>u</th>
<th>888</th>
<th>346</th>
<th>1</th>
<th>551</th>
<th>581</th>
<th>500</th>
<th>968</th>
<th>273</th>
<th>340</th>
<th>1001</th>
</tr>
</thead>
<tbody>
<tr>
<td>v</td>
<td>112</td>
<td>654</td>
<td>999</td>
<td>449</td>
<td>419</td>
<td>500</td>
<td>32</td>
<td>727</td>
<td>660</td>
<td>1-1</td>
<td></td>
</tr>
<tr>
<td>u = 1000 – v, v = 1000 – u, (u + v = 1000)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>m</th>
<th>2</th>
<th>40</th>
<th>10</th>
<th>800</th>
<th>200</th>
<th>5</th>
<th>8</th>
<th>50</th>
<th>25</th>
<th>800</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>400</td>
<td>20</td>
<td>80</td>
<td>1</td>
<td>4</td>
<td>160</td>
<td>100</td>
<td>16</td>
<td>32</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>m = 800 ÷ n, n = 800 ÷ m, (m × n = 800)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th>3</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>–</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

45 min
R: Mental calculation
C: Multiplication and division tables. Operations up to 1000
E: Operations up to 2000

Lesson Plan

13

Notes

Week 3

Activity

1

Multiplication table practice
T says a multiplication and:

a) chooses Ps at random to answer,

b) Ps answer in order round class,

c) T says a multiplication, P answers it and says a multiplication for next P to answer, etc. (relay round class)

5 min

2

Chain calculations
Listen to my instructions. Do the calculations in your head and write the results of each step one below the other in your Ex. Bks. Nod your head when you have done each step. Show me the final result when I say. e.g.


Show me your answer . . . now! (100)

Let's write the operations on the BB. Ps come to BB or dictate to T.

BB: 800 \div 4 = 200; 200 + 10 = 210; 210 \times 3 = 630; 630 + 70 = 700; 700 \div 7 = 100

How could we write it as one equation? Ps suggest how to do it. Class agrees/disagrees. T helps with the brackets if necessary. Let's check it.

BB: [(800 \div 4 + 10) \times 3 + 70] \div 7 = 100

Repeat for, e.g.


Show me . . . now! (560)

Ps suggest how to write it as one equation (with T's help if necessary).

BB: [(20 \times 8 + 20) \div 60 + 60] \div 9 \times 80 = 560

10 min

3

Boom!
Everyone stand up! We will count in multiples of 10 but you must say 'Boom' instead of the multiples of:

a) 50: '0, 10, 20, 30, 40, 'Boom', 60, 70, 80, 90, 'Boom', 110, . . .'

b) 40 or 70: '0, 10, 20, 30, Boom, 50, 60, Boom, Boom, 90, . . .'

etc. Continue until fewer than 5 Ps remain standing. Let's give them a round of applause!

15 min

4

Secret numbers
I am thinking of a number. I will give you a clue and you must work out what it is. Show me the number when I say.

a) It is 300 more than half of 420.

Show me . . . now! (510) P who answered correctly explains to those who did not. Let's check each step to make sure it is correct.

b) If I multiply it by 5, then add 400, then divide by 11, the result is 50.

Show me . . . now! (30) P explains. Class checks each step. If time, Ps can think of secret numbers and give clues too!

20 min

Whole class activity
At speed
T notes Ps who need to use their own × tables or to look at the × table on classroom wall.

Praising, encouragement only

Whole class activity (but individual mental calculation)
Wait until majority are ready before continuing to next step.

Responses written on scrap paper or slates and shown in unison.

Agreement, praising

Discussion, agreement, checking, praising

Remind Ps to use curved brackets for 1st set needed, then square brackets for 2nd set needed.

Check that operations will be done in the correct order.

You have been very clever!

Whole class activity
At speed, in order round class Ps knock on desks when they hear a mistake and P who made it must sit down.

In good humour!
Ps can choose the 'Boom' multiples too.

Individual work in Ex. Bks.
Responses shown on scrap paper or slates in unison.

BB: e.g.

a) \( n = 420 \div 2 + 300 = 210 + 300 = 510 \)

b) \( n = (50 \times 11 - 400) \div 5 = (550 - 400) \div 5 = 150 \div 5 = 30 \)
### Activity

**5 Inequalities**

Which natural numbers will make the inequality true? Elicit that natural numbers are positive whole numbers.

**a)** Class reads inequality aloud first.

'Five hundred plus the square is less than six hundred and eighteen minus one hundred and nine'

What should we do first? (Work out the RHS.)

Ps come to BB to do calculation, explaining reasoning. Class agrees/disagrees. Ps check with least and greatest possible values.

\[
500 + \quad < \quad 618 - 109
\]

\[
\begin{array}{ccc}
1, 2, 3, 4, 5, 6, 7, 8
\end{array}
\]

**b)** Class reads the inequality aloud first. What should we do first? (Work out the LHS and RHS.) Ps come to BB to do calculations, explaining reasoning. Class agrees/disagrees. Ps check with least and greatest possible values.

\[
\begin{array}{c}
\text{BB: } 3 \times 27 + 150 \quad < \quad 200 + \quad < \quad 236\\
231 \quad < \quad 200 + \quad < \quad 236
\end{array}
\]

\[
\begin{array}{c}
\text{BB: } 500 + \quad \quad < \quad 618 - 109
\end{array}
\]

\[
\begin{array}{c}
\quad : 1, 2, 3, 4, 5, 6, 7 \text{ or } 8
\end{array}
\]

---

**Notes**

Whole class activity

Inequalities written on BB or SB or use enlarged copy master or OHP

In unison

Discussion, reasoning, agreement, checking, praising

**Check:**

BB: \[500 + 1 \quad < \quad 509 \] ✔

\[500 + 8 \quad < \quad 509 \] ✔

In unison

Discussion, reasoning, agreement, checking, praising

**Check:**

BB: \[231 \quad < \quad 200 + 32 \quad < \quad 236 \] ✔

\[231 \quad < \quad 200 + 35 \quad < \quad 236 \] ✔

---

### Lesson Plan 13

**6 PbY4a, page 13**

Q. 1 Read: *Do the calculations in the correct order.*

Deal with one at a time. Ps write results of 1st calculations above the operation signs.

Review at BB with whole class. Ps come to BB or dictate to T.

Class agrees/disagrees. Mistakes discussed and corrected.

**Solution:**

\[
\begin{array}{c}
a) \quad 2 \times 400 - 258 \quad = \quad 542\\
\quad 560
\end{array}
\]

\[
\begin{array}{c}
b) \quad 3 \times 140 - 130 \quad = \quad 290\\
\quad 360
\end{array}
\]

\[
\begin{array}{c}
c) \quad 7 \times 80 + 258 \quad = \quad 818\\
\quad 818
\end{array}
\]

\[
\begin{array}{c}
d) \quad 220 + 4 \times 90 \quad = \quad 580\\
\quad 420
\end{array}
\]

\[
\begin{array}{c}
e) \quad 912 - 5 \times 50 \quad = \quad 662\\
\quad 420
\end{array}
\]

\[
\begin{array}{c}
f) \quad 595 - 6 \times 70 \quad = \quad 175\\
\quad 250
\end{array}
\]

---

**7 PbY4a, page 13**

Q. 2 Read: *Do the calculations in the correct order.*

Deal with one at a time. Ps write results of 1st calculations above the operation signs.

Review at BB with whole class. Ps come to BB or dictate to T.

Class agrees/disagrees. Mistakes discussed and corrected.

**Solution:**

\[
\begin{array}{c}
a) \quad 640 \div 8 \times 379 \quad = \quad 459\\
\quad 650
\end{array}
\]

\[
\begin{array}{c}
b) \quad 580 + 420 \div 6 \quad = \quad 650\\
\quad 650
\end{array}
\]

\[
\begin{array}{c}
c) \quad 910 - 480 \div 8 \quad = \quad 850\\
\quad 60
\end{array}
\]

\[
\begin{array}{c}
d) \quad (1052 - 492) \div 7 \quad = \quad 80\\
\quad 560
\end{array}
\]

\[
\begin{array}{c}
e) \quad 810 \div 9 \div 34 \quad = \quad 56\\
\quad 90
\end{array}
\]

\[
\begin{array}{c}
f) \quad 1200 \div (9 \div 5) \quad = \quad 300\\
\quad 70
\end{array}
\]

---

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Activity

PbY4a, page 13

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

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

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

Repeat for each of the other questions.

Solution:

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

Plan: G: 324, R: 324 × 3

E: 300 × 3 = 900

C: e.g. 324 × 3 = 900 + 60 + 12 = 972

Answer: Rita has 972 stamps.

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

Plan: H: 324, M: 324 ÷ 3

E: 300 ÷ 3 = 100

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

Answer: Mary has 108 postcards.

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

Plan: S: 324, J: 324 × 4

E: 300 × 4 = 1200

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

Answer: Jack has 1296 marbles.

d) Johnny has 324 football cards and Mike has 1 quarter of that number. How many football cards does Mike have?

How many football cards do the two boys have altogether?

i) Plan: J: 324, M: 324 ÷ 4

E: 320 ÷ 4 = 80

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

Answer: Mike has 81 football cards.

ii) Plan: J + M: 324 + 81

E: 320 + 80 = 400

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

Answer: They have 405 football cards altogether.

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

Plan: C: £324, 1 car: £9

No. of cars: £324 ÷ £9

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

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

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

Notes

Individual work, monitored, helped.

Discussion, reasoning, agreement, self-correction, praising

Keep up a good pace throughout.

Accept any form of correct calculation, e.g.
R: Mental calculation
C: Multiplication and division tables. Operations up to 1000
E: Operations up to 2000

**Lesson Plan**

**Week 3**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong> Secret number</td>
<td>Whole class activity</td>
</tr>
<tr>
<td>I am thinking of a number. Try to find out what it is by asking me questions about it. I can answer only yes or no and your question must be different from the previous one.</td>
<td>T chooses Ps at random to ask a question.</td>
</tr>
<tr>
<td>e.g. • Is it less than 1000? Yes • Does it have 3 digits? Yes • Is it more than 500? No • Is it a whole hundred? No • Is its hundreds digit odd? Yes • Is it less than 300? No • Is its tens digit less than 5? No • Is it more than 375? Yes • Is it less than 390? No • Does it have two digits the same? No • Is it odd? Yes • Is its units digit less than 5? Yes • It is 391! Yes</td>
<td>Encourage Ps to ask logical questions and to keep in mind clues already found out from previous questions.</td>
</tr>
<tr>
<td><strong>5 min</strong></td>
<td>Ps can make notes in Ex. Bks.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2</strong> Calculation practice</td>
<td>At a good pace</td>
</tr>
<tr>
<td>T dictates 5 numbers. Ps write them in Ex. Bks, one below the other, lining them up by place value.</td>
<td>Extra praise for clever questions</td>
</tr>
<tr>
<td>e.g. T: 567 318 9 935 76</td>
<td>Repeat with another number if time (or P comes to front to think of a number and to answer questions.)</td>
</tr>
<tr>
<td>Do these calculations in your Ex. Bks. Show me the result when I say.</td>
<td>Individual work but class kept together</td>
</tr>
<tr>
<td>a) What is the difference between the greatest and 2nd greatest numbers? Show me . . . now! (368) Write a ‘B’ at the bottom of your page if you were correct.</td>
<td>Responses written on scrap paper or slates.</td>
</tr>
<tr>
<td>b) What is the sum of the three 3-digit numbers? Show me . . . now! (1820) Write an ‘E’ at the bottom of your page if you were correct.</td>
<td>Quick check after each one.</td>
</tr>
<tr>
<td>c) Divide the 2nd greatest number by the smallest number. Show me . . . now! (63) Write an 'S' at the bottom of your page if you were correct.</td>
<td>Ps who answered correctly come to BB to explain to Ps who were wrong.</td>
</tr>
<tr>
<td>d) What is the product of the two smallest numbers? Show me . . . now! (684) Write a 'T' at the bottom of your page if you were correct.</td>
<td>Reasoning, agreement, self-correcting, praising</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BB:</th>
<th></th>
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<tbody>
<tr>
<td>19</td>
<td>3 5</td>
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<tr>
<td>5</td>
<td>6 2 7</td>
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<tr>
<td>3</td>
<td>6 8</td>
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<tr>
<td>5 6 7</td>
<td>3 1 8</td>
</tr>
<tr>
<td>9 3 5</td>
<td>1 8 2 0</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
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<tr>
<td>9 5 6 7</td>
<td></td>
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<tr>
<td>5 4</td>
<td></td>
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<td>2 7</td>
<td></td>
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<tr>
<td>2 7</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
</tr>
<tr>
<td>7 6</td>
<td>9</td>
</tr>
<tr>
<td>6 8 4 1</td>
<td></td>
</tr>
</tbody>
</table>

Ps shout out in unison. Praising |
### Activity 3

**Multiplication**

Let's show these multiplications in detail to remind ourselves what we are doing. Ps come out to work on BB and rest of class work in Ex. Bks.

**BB:**

<table>
<thead>
<tr>
<th>a)</th>
<th>b)</th>
</tr>
</thead>
</table>
| \[\begin{array}{c}
314 \\
\times \\
4
\end{array}\] | \[\begin{array}{c}
162 \\
\times \\
3
\end{array}\] |
| \[\begin{array}{c}
2 \times 4U = 8U \\
= 1T + 6U
\end{array}\] | \[\begin{array}{c}
2 \times 4U = 8U \\
= 1T + 6U
\end{array}\] |

**Details of reasoning:**

- \[\begin{array}{c}
314 \\
\times \\
4
\end{array}\]  
  \[4 \times 4U = 16U = 1T + 6U\]
  \[4 \times 1T = 4T; \ 4T + 1T = 5T\]
  \[4 \times 3H = 12H = 1Th + 2H\]

**Lesson Plan 14**

#### Notes

Whole class activity
- Written on BB or use enlarged copy master or OHP
- Encourage Ps to give reasoning with details of place-value (as example below)
- Agreement, praising

Use the expressions to show:
- place value (e.g. 5T)
- digit value (e.g. 5)
- real value (e.g. 50)

If any P still does not understand, ask them to do another example on BB (with help of rest of class)

#### Individual work, monitored, helped

- Written on BB or use enlarged copy master or OHP
- Reasoning, agreement, self-correction, praising
- Feedback for T

Ps point out relationships. e.g. doubling one term and halving the other term gives the same result, etc.
### Activity 5

**Division**

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

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

**BB:**

**a)** \(476 \div 2 = 200 + 35 + 3 = 238\)

```
<table>
<thead>
<tr>
<th></th>
<th>2</th>
<th>3</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>4</td>
<td>7</td>
<td>6</td>
</tr>
</tbody>
</table>
```

Shorter way:

```
<table>
<thead>
<tr>
<th></th>
<th>2</th>
<th>3</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>4</td>
<td>7</td>
<td>6</td>
</tr>
</tbody>
</table>
```

Details: \(4H \div 2 = 2H\)

- \(7T \div 2 = 3T\), and 1T remains
- \(1T + 6U = 16U\)
- \(16U \div 2 = 8U\)

**b)** \(812 \div 7 = 100 + 10 + 6 = 116\)

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<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>1</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>8</td>
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<td>2</td>
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</tbody>
</table>
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Shorter way:

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<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>1</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>8</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
```

Details: \(8H \div 7 = 1H\), and 1H remains

- \(1H + 1T = 11T\)
- \(11T \div 7 = 1T\), and 4T remains
- \(4T + 2U = 42U\)
- \(42U \div 7 = 6U\)

**c)** \(714 \div 6 = 100 + 10 + 9 = 119\)

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<table>
<thead>
<tr>
<th></th>
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<th>9</th>
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</thead>
<tbody>
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<td>6</td>
<td>7</td>
<td>1</td>
<td>4</td>
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</tbody>
</table>
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Shorter way:

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<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>1</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>7</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>
```

Details: \(7H \div 6 = 1H\), and 1H remains

- \(1H + 1T = 11T\)
- \(11T \div 6 = 1T\), and 5T remains
- \(5T + 4U = 54U\)
- \(54U \div 6 = 9U\)

**d)** \(735 \div 5 = 100 + 40 + 7 = 147\)

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<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>4</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>7</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>
```

Shorter way:

```
<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>4</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>7</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>
```

Details: \(7H \div 5 = 1H\), and 2H remains

- \(2H + 3T = 23T\)
- \(23T \div 5 = 4T\), and 3T remains
- \(3T + 5U = 35U\)
- \(35U \div 5 = 7U\)

**Notes**

Whole class activity

Divisions written on BB or SB or OHT

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

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

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

At a good pace

Reasoning, agreement

Praising, encouragement only

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**Activity 6**  
*PbY4a, page 14*

**Q.2** Read: *Estimate the quotient first, then do the division. Check with multiplication.*

Ps estimate by rounding to nearest 100. Ps can use long or short division. Review at BB with whole class. Ps come to BB to do calculations, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected.

**Solution:**

a) \[ 40 \text{ min} \]

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

Deal with one part at a time. Ps read problem themselves and write just a plan for each first. Review plans with the whole class. A, what plan did you write? Who wrote the same? Who wrote a different one? etc. Class agrees on which plans are correct. Mistakes corrected.

Then Ps estimate, calculate and write the answers. Ps can use *Ex. Bks* for calculations and write only plans and answers in *Pbs*. Review with whole class. Ps come to BB to do calculations, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected.

**Solution:**

a) Lisa had collected 516 shells. She gave 1 quarter of the shells to Alice and 1 third of them to Julie. How many shells did Lisa have left?

*Plan:*  
L: 516, A: 516 \(\div\) 4, J: 516 \(\div\) 3

L had left: \(516 - (516 \div 4 + 516 \div 3)\)

C: e.g. 516 \(\div 4\) = 400 \(\div 4 + 80 \div 4 + 36 \div 4\)  
= 100 + 20 + 9 = 129  
A: 129

516 \(\div 3\) = 300 \(\div 3 + 210 \div 3 + 6 \div 3\)  
= 100 + 70 + 2 = 172  
J: 172

A + J: 129 + 172 = 229 + 72 = 299 + 2 = 301

L – (A + J): 516 – 301 = 215

*Answer:* Lisa had 215 shells left.
Lesson Plan 14

Activity 7  
(Continued)

b) Darren bought 5 pairs of sports socks for £7.75. Jamie bought 6 pairs of the same kind of socks. How much did Jamie pay?

Plan: D: 5 pairs → £7.75 = 775 p,
1 pair → 775 p ÷ 5
J: 6 pairs → (775 p ÷ 5) × 6

C: e.g. 775 ÷ 5 = 500 ÷ 5 + 250 ÷ 5 + 25 ÷ 5
= 100 + 50 + 5 = 155 (p)
155 × 6 = 100 × 6 + 50 × 6 + 5 × 6
= 600 + 300 + 30 = 930 (p)
930 p = £9.30

Answer: Jamie paid £9.30

Notes
Agreement on plan first, then individual calculation
Reasoning, agreement, self-correcting, praising

E: 800 ÷ 5 × 6 = 160 × 6
= 960 (p)

Or BB: 6 pairs =

5 pairs + 1 pair

155 155
2 2
1 1 5 5
5 7 7 5
+ 1 1 5 5
9 3 0
9 3 0

Answer: Jamie paid £9.30

45 min
Activity

Tables practice, revision, activities, consolidation

*Solutions:*

**Q.1**  4, 13, 22, 31, 40, 103, 112, 121, 130, 202, 211, 220, 301, 310, 400

**Q.2**  a)  F  (114 is not a multiple of 4)
  b)  T
  c)  F  (100 is 10 whole tens)
  d)  T

**Q.3**

<table>
<thead>
<tr>
<th>The number is divisible by 9</th>
<th>even</th>
<th>odd</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>900</td>
<td>450</td>
</tr>
<tr>
<td>9</td>
<td>99</td>
<td>207</td>
</tr>
<tr>
<td>63</td>
<td></td>
<td>2007</td>
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</table>

<table>
<thead>
<tr>
<th>The number is not divisible by 9</th>
<th>even</th>
<th>odd</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>160</td>
<td>60</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td>103</td>
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<tr>
<td>63</td>
<td>49</td>
<td>669</td>
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</table>

**Q.4**

<table>
<thead>
<tr>
<th>a) 2</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ 3</td>
<td>5</td>
<td>2</td>
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<tr>
<td>5</td>
<td>11</td>
<td>9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>b) 2</th>
<th>9</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ 7</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>17</td>
<td>0</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>c) 9</th>
<th>8</th>
<th>8</th>
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<tbody>
<tr>
<td>– 4</td>
<td>3</td>
<td>6</td>
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<tr>
<td>5</td>
<td>5</td>
<td>2</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>d) 8</th>
<th>5</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>– 3</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>18</td>
<td>8</td>
</tr>
</tbody>
</table>

**Q.5**

\[45 + 75 \times 3\]

\[\frac{1715}{21}\]

\[770 \div 7 \times 5\]

\[\frac{(1324 - 423) \times 2}{100} \]

\[\frac{(328 - 139) \div 9}{1Th + 8T + 2U}\]

\[\frac{1645 + 560 \div 8}{100} \]

\[\frac{270}{1215} \]

\[\frac{324 \div 3 + 892}{100}\]
**Activity 1**

**Addition and subtraction practice**

Let’s fill in the missing numbers. Ps come out to BB to write missing values, saying whole equation and explaining reasoning. Class agrees/disagrees. Check with reverse operation.

BB:

1. $36 + \boxed{50} = 86$
2. $40 + 57 = 97$
3. $84 - \boxed{70} = 14$
4. $72 - 30 = 42$
5. $236 + \boxed{50} = 286$
6. $40 + 357 = 397$
7. $584 - \boxed{70} = 514$
8. $472 - 30 = 442$
9. $236 + \boxed{450} = 686$
10. $240 + 357 = 597$
11. $584 - \boxed{270} = 314$
12. $572 + 130 = 442$

**Notes**

Whole class activity

Written on BB or SB or OHT or use enlarged copy master

At a good pace

Agreement, praising

Feedback for T

**Activity 2**

**Multiplication and division practice**

Let’s fill in the missing numbers. Ps come out to BB to write missing values, saying whole equation and explaining reasoning. Class agrees/disagrees. Check with reverse operation.

BB:

13. $\boxed{50} \times 3 = 150$
14. $3 \times 60 = 180$
15. $\boxed{20} \times 9 = 180$
16. $8 \times 70 = 560$
17. $40 \times \boxed{20} = 800$
18. $8 \times 35 = 1000$
19. $5 \times 25 = 100$
20. $\boxed{40} \div 8 = 40$
21. $450 \div \boxed{50} = 9$
22. $\boxed{300} \div 6 = 50$
23. $420 \div 70 = 6$

**Notes**

Whole class activity

Written on BB or SB or OHT or use enlarged copy master

At a good pace

Agreement, praising

Feedback for T

**Activity 3**

**Sequences**

T says and writes on BB the first few terms of a sequence. Ps note terms in Ex. Bks and work out the rule. Let’s continue the sequence. What is the rule? Who agrees? Who can express it in a different way? etc.

a) 1, 5, 9, 13, (17, 21, 25, 29, 33, 37, 41, 45, 49, 53, 57, . . .)

Rule: Increasing by 4, or gives a remainder of 1 after dividing by 4

b) 18, 33, 48, 63, (78, 93, 108, 123, 138, 153, 168, 183, . . .)

Rule: Increasing by 15, or gives a remainder of 3 after dividing by 15 (or by 5)

c) 11, 111, 211, 311, (411, 511, 611, 711, 811, 911, 1011, . . .)

Rule: Increasing by 100, or gives a remainder of 11 after dividing by 100 (or by 50 or by 20)

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### Activity 4

#### Problems

Listen carefully, note the data, do the calculation in your *Ex. Bks.* and show me the result when I say.

a) *Rabbit’s burrow is 216 m from the woods. If one day Rabbit makes 2 journeys to the wood and back, what distance did he cover that day?*

Show me . . . now! (864 m)

P who responded correctly explains to those who did not. e.g. He made 2 journeys there and back so he covered the distance 4 times.

C: \(216 \times 4 = 200 \times 4 + 10 \times 4 + 4 \times 4\) or \[\begin{array}{c|c|c|c}
2 & 1 & 6 \\
\times & 4 \\
\hline
8 & 6 & 4 \\
\end{array}\]

\[= 800 + 40 + 24\]

\[= 864\] (m)

*Answer:* Rabbit covered 864 m.

b) *Dan measured the length of his exercise book 5 times and found it was 295 mm each time. How wide is Dan’s exercise book?*

Show me . . . now! (295 mm)

No calculation is needed. The width is given in the question!

*Answer:* Dan’s exercise book is 295 mm wide.

---

### Activity 5

#### Divisibility

Let’s make 2-digit numbers from the digits 0, 1, 2, 3, 4 and 5 so that they are divisible by

- a) 2 (10, 12, 14, 20, 22, 24, 30, 32, 34, 40, 42, 44, 50, 52, 54)
- b) 3 (12, 15, 21, 24, 30, 33, 42, 45, 51, 54)
- c) 4 (12, 20, 24, 32, 40, 44, 52)
- d) 5 (10, 15, 20, 25, 30, 35, 40, 45, 50, 55)
- e) 7 (14, 21, 35, 42)

If a P makes a mistake, show it by reasoning with division. e.g.

- 3 is **not** a factor of 52, because \[52 \div 3 = 30 \div 3 + 22 \div 3\]

\[= 10 + 7, r 1 = 17, r 1\]

- 43 is **not** divisible by 4, because \[43 \div 4 = 10, r 3\]

\[25 min\]

---

**Notes**

Whole class activity

T repeats each question slowly and a P repeats in own words.

Give Ps time to think and calculate.

Results written on scrap paper or slates and shown in unison.

Reasoning, agreement, self-correction, praising

T stresses that Ps should listen to (or read) questions carefully and picture them in their heads.

Imagine yourself measuring your own *Ex. Bk.* 5 times!
### Activity 6

#### PbY4a, page 16

Q.1 Read:  *Calculate the quotient and the remainder. Check with multiplication.*

Deal with one part at a time. Review at BB with whole class. Ps come to BB (with their Pb's) to do calculation and explain reasoning. Class points out errors. Mistakes discussed/corrected.

**Solution:**

<p>| | | |</p>
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<tr>
<th></th>
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**Check:**

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</table>

**Solution:**

31 min

---

### Activity 7

#### PbY4a, page 16

Q.2 Read:  *Is 642 divisible by these numbers? Do the calculations, then write YES or NO.*

How can we tell whether a number is divisible by another number? (After doing the division there will be no remainder.) Set a time limit. Ps do long or short division (or horizontal division in Ex. Bks if they prefer) and write YES or NO on dotted lines in Pb's.

Review at BB with whole class. T points to a number. Is 642 divisible by this number? Class shouts YES or NO in unison. Ps who respond incorrectly come to BB to do calculation (with help of class). Mistakes corrected.

Agree that 642 is divisible by 3 and 6, but not by 4 and 9. Elicit that 3 and 6 are factors of 642 (642 is a multiple of 3 and 6).

**Solution:**

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**Check:**

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</table>

**Solution:**

36 min

---

### Notes

Individual work, monitored, helped (or part a) done with whole class first if Ps are unsure)

Written on BB or use enlarged copy master or OHP

Reasoning, agreement, self-correcting, praising

Accept any correct method of calculation (horizontal division in Ex. Bks, long division or short division)

Ps circle remainders and/or write beside answers.

Feedback for T

Individual work, monitored, helped

Differentiation by time limit

Written on BB or use enlarged copy master or OHP

Reasoning, agreement, self-correcting, praising

T shows another way to reason, e.g. BB: 642 = 600 + 30 + 12 (all divisible by 3 and 6) or 642 = 630 + 9 + 3 (630 and 9 are divisible by 9 but 3 is not) or 642 = 400 + 240 + 2 (400 and 240 are divisible by 4 but 2 is not)
**Y4**

### Lesson Plan 16

**Activity**

<p>| | |</p>
<table>
<thead>
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<tbody>
<tr>
<td>8</td>
<td><strong>PbY4a, page 16</strong></td>
</tr>
</tbody>
</table>
| Q.3 | Read: _Do the calculations in your exercise book._  
Write the answers in the boxes. |
|   | Set a time limit. Ps read questions themselves, do calculations and write results in _Pbs_. |
|   | Review with whole class. T (or P) reads each question and class show solutions on command. Ps who respond correctly explain at BB to those who were wrong. Mistakes corrected. |
|   | **Solution:** |
| a) | _Which number is three times as much as 264?_ (792)  
BB: e.g. 264 \times 3 = 600 + 180 + 12 = 792 |
| b) | _Three times a numbers is 264. What is the number?_ (88)  
BB: e.g. 264 \div 3 = 240 \div 3 + 24 \div 3 = 80 + 8 = 88 |
| c) | _Which number is 1 third of 426?_ (142)  
BB: e.g. 426 \div 3 = 300 \div 3 + 120 \div 3 + 6 \div 3  
= 100 + 40 + 2 = 142 |
| d) | _One third of a number is 426. What is the number?_ (1278)  
BB: e.g. 426 \times 3 = 1200 + 60 + 18 = 1278 |
|   | **Remainders** |
|   | Let's practise finding remainders. Ps dictate numbers to T who writes on BB as a sequence. Class points out errors or missed numbers.  
T decides when to skip some terms and continue from other numbers. |
| a) | _Tell me the natural numbers which have a remainder of_ |
| i) | _1 after they have been divided by 3,_  
e.g. 1, 4, 7, 10, 13, 16, 19, . . ., 601, . . ., 820, . . .  
Elicit that they are 1 more than multiples of 3. |
| ii) | _2 after dividing by 3,_  
e.g. 2, 5, 8, 11, . . ., 602, . . ., 821, . . .  
Elicit that they are 2 more than multiples of 3. |
| iii) | _1 after dividing by 7_  
e.g. 1, 8, 15, 22, 29, . . ., 351, . . ., 904, . . .  
Elicit that they are 1 more than multiples of 7. |
| b) | **PbY4a, page 16, Q.4** |
|   | Read: _Write 2-digit numbers which have a remainder of 6 after dividing by 7._ |
|   | Give Ps time to write numbers in _Pbs_. Then Ps dictate numbers to T who writes them on BB as a sequence. Class points out errors or missed numbers.  
BB: 13, 20, 27, 34, 41, 48, 55, 62, 69, 76, 83, 90, 97  
Elicit that they are 6 more (or 1 less) than multiples of 7 |

### Notes

Individual work, monitored, helped  
Ps may use any correct method of calculation.  
Responses shown on scrap paper or slates in unison.  
Reasoning, agreement, self-correction, praising

Whole class activity  
Elicit that natural numbers are positive whole numbers.  
At speed in order round class  
Check on BB that new 3-digit start numbers have the correct remainder, e.g.  
BB:  
820 = 600 + 210 + 9 + 1  
351 = 350 + 1  
904 = 700 + 140 + 63 + 1  
Individual work, monitored  
(or continue as whole class activity)  
Agreement, self-correcting praising
### Activity 1

**Forming rectangles**

Let's draw different rectangles which have a perimeter of 24 units. Elicit that 1 unit is the side of a grid square.

Ps come to BB to draw rectangles on the grid, confirming perimeter length by writing an operation. What is its area? e.g.

BB:

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</table>

Extra praise for unexpected sides e.g.

\[
P = 2 \times (11 \frac{1}{2} + \frac{1}{2}) = 2 \times 12 = 24 \text{ (units)}
\]

\[
A = 5 + 1 \text{ half} + 1 \text{ quarter} = 5 + 3 \text{ quarters} = 5 \frac{3}{4} \text{ (unit squares)}
\]

### Notes

Whole class activity

Grid drawn on BB or use squared BB or enlarged copy master or OHP

Ps could have copies on desks too if they wish.

At a good pace

Reasoning, agreement, praising

T helps with writing operations where necessary.

[Revision of perimeter and area of a rectangle (square).]

What do you notice?

Agree that the 24-unit perimeter which gives the largest area is the most regular shape, i.e. a square.

If a P suggests this case, T helps with calculating the area.

---

### Activity 2

**PbY4a, page 17**

**Q.1** Read: *The area of a rectangle is 360 unit squares.*

How long is the other side if one side is:

a) 5 units, b) 12 units, c) 8 units?

T or P explains task with aid of a diagram. Elicit that the operation to be done is division. Ps can do calculations in *Ex. Bks* if they cannot do them mentally.

Review at BB with whole class. Ps come to BB to show their calculations. Who agrees? Who did it another way? etc.

**Solution:** e.g.

a) \( 360 \div 5 = 350 \div 5 + 10 \div 5 = 70 + 2 = 72 \) (units)

b) \( 360 \div 12 = 360 \div 6 + 2 = 60 \div 2 = 30 \) (units)

c) \( 360 \div 8 = 320 \div 8 + 40 \div 8 = 40 \div 5 = 45 \) (units)

Individual work, monitored, helped but whole class introduction

BB:

\[
\begin{array}{cc}
 & b \\
\hline \\
A & = 360 \\
\hline \\
& c \\
\end{array}
\]

\[
A = b \times c \\
\frac{c}{b} = 360 \text{ unit squares}
\]

\[
b = A \div c, \ c = A \div b
\]

Reasoning, agreement, self-correcting, praising

(or vertical long or short division)
Read: Calculate the perimeter of each rectangle.

Review at BB with whole class. Ps dictate operations to T, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected.

Solution:

a) \[ P = 2 \times (5 + 72) = 2 \times 77 = 154 \text{ (units)} \]
b) \[ P = 2 \times (12 + 30) = 2 \times 42 = 84 \text{ (units)} \]
c) \[ P = 2 \times (8 + 45) = 2 \times 53 = 106 \text{ (units)} \]

How could we show the sides of all the rectangles which have an area of 360 unit squares? T asks several Ps what they think. Agree that best way would be to show them in a table.

T (or P) draws table on BB or OHT. Let’s do it logically! Which values should be put in the first column? (e.g. 1 and 360)

Ps dictate to T or come to BB, explaining reasoning. Encourage Ps to do the calculations mentally. Class points out errors.

What is the rule for the table? Who can write it a different way? etc.

BB:

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

18 min

Extension

Factorising

Let’s break down 360 into its lowest factors. T shows the first 1 or 2 steps on BB and Ps continue the diagram. Class agrees/disagrees.

BB: e.g.

\[
\begin{array}{c}
360 \\
40 \\
5 \\
2 \\
2 \\
3 \\
3 \\
9 \\
3 \\
2 \\
2 \\
3 \\
6 \\
6 \\
2 \\
2 \\
3 \\
3 \\
6 \\
6 \\
2 \\
2 \\
3 \\
3 \\
5 \\
360 = 2 \times 2 \times 2 \times 3 \times 3 \times 5
\end{array}
\]

What kind of numbers have we circled? (Prime numbers). What is a prime number? (A number which has only 2 factors: 1 and itself.) We can say that we have broken down 360 into its prime factors.

Does it matter how we do factorisation? (No, as we will always end up with the same prime factors.)
Activity

4  
PbY4a, page 17

Q.2 Read: Practise division.

Check your divisions with multiplication in your head (or in your Ex. Bks) if you have time. T sets a time limit.

Review at BB with whole class. Ps come to BB or dictate to T, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected. Do checks on BB with whole class. Ps dictate what T should write.

Solution:

<table>
<thead>
<tr>
<th>a)</th>
<th>b)</th>
<th>c)</th>
<th>d)</th>
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</thead>
<tbody>
<tr>
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<td>6</td>
<td>15</td>
<td>3</td>
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<tr>
<td>11</td>
<td>2</td>
<td>9</td>
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<td>3</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

Check:

- 1116 x 4
- 546
- 446
- 1

- 1668 x 4
- 6672
- 6672
- 0

- 1116 x 5
- 5580
- 5580
- 0

- 1121 x 3
- 3363
- 3363
- 0

31 min

5  
PbY4a, page 17

Q.3 Read: Practise division.

Check your divisions with multiplication in your head (or in your Ex. Bks) if you have time. T sets a time limit.

Review at BB with whole class. Ps come to BB or dictate to T, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected. Do checks on BB with whole class. Ps dictate what T should write.

Solution:

<table>
<thead>
<tr>
<th>a)</th>
<th>b)</th>
<th>c)</th>
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</thead>
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</tbody>
</table>

Check:

- 852 x 8
- 6816
- 6816
- 0

- 832 x 9
- 7488
- 7488
- 0

- 71 x 5
- 355
- 355
- 0

- 1931 x 3
- 5793
- 5793
- 0

39 min

Notes

Individual work, monitored, (helped)

Written on BB or use enlarged copy master or OHP

Accept long or short vertical division.

Differentiation by time limit

Reasoning, agreement, checking, self-correction, praising

Feedback for T
Q.4 Read: Do the calculations and write the answers in your exercise book.

Try to picture the problem in your head. Draw a diagram if it will help you.

For a) and b), Ps read problem themselves, do calculation and write answer as a sentence in Ex. Bks.

Review with the whole class. Ps come to BB to do calculations, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected.

Solution:

a) A floor tile is 205 mm wide. How wide is the utility room if 9 tiles laid end to end are needed for each row?

Plan: 1 tile: 205 mm, 9 tiles: 205 mm × 9

C: e.g. 205 × 9 = 200 × 9 + 5 × 9 = 1800 + 45

= 1845 (mm)

Answer: The utility room is 1 m 84 cm 5 mm wide.

b) 4 sacks of wheat weigh 304 kg altogether. How much wheat, on average, is in each sack?

Plan: 4 sacks: 304 kg, 1 sack: 304 kg ÷ 4

C: e.g. 304 ÷ 4 = 280 ÷ 4 + 24 ÷ 4 = 70 + 6 = 76 (kg)

Answer: On average, there is 76 kg of wheat in each sack.

Why do we say 'on average'? (Because there might be 76 kg in each sack but there could also be, e.g. 78 kg in sack 1, 74 kg in sack 2, 75 kg in sack 3, 77 kg in sack 4, which also give a total of 304 kg.)

c) Read: Study the diagram. Make up a question about it.

Set a time limit. Ps (Ps can work in pairs.)

Review at BB with whole class. Ps suggest questions. Class agrees whether they are valid. Deal with all cases.

e.g. If a man walks at a steady speed and takes 7 minutes to cover 420 m, how far did he walk in the first minute?

T (or class) chooses the 'best' one to solve. Ps come to BB or dictate what T should write. P who thought of the question decides whether the solution is correct.

e.g. 7 minutes: 420 m 1 minute: 420 m ÷ 7 = 60 m

Let's give them a round of applause!

Individual work, monitored, helped
(or all done as whole class activity if time is short)

Discussion, reasoning, agreement, self-correction, praising

Whole class discussion
Allow Ps time to think and explain. T gives hints only if necessary.

Individual (or paired) work, monitored

Diagram drawn on BB or use enlarged copy master or OHP

Whole class discussion.
Praise all contributions.
Extra praise if Ps realise the similarity to part b).
i.e. the man has to walk at a steady speed, otherwise we can only work out the average distance he covered per minute.

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## Activity

### 1. Boom!
Everyone stand up. I will say the first few terms of a sequence and you must continue it but you must say 'boom' instead of any number divisible by 9.

- **a)** 3, 6, (boom, 12, 15, boom, 21, 24, boom, 30, 33, boom, …)
- **b)** 2, 4, 6, (8, 10, 12, 14, 16, boom, 20, 22, 24, 26, 28, …)
- **c)** 10, 20, 30, (40, 50, 60, 70, 80, boom, 100, 110, 120, …)

This time you must say 'boom' instead of any number divisible by either 4 or 6!

- **d)** 1, 2, 3, boom, 5, boom, 7, boom, 9, 10, 11, boom, 13, …

**6 min**

### 2. Calculation practice

**T** asks questions and **Ps** calculate in *Ex. Bks* (or mentally). **Ps** write answers on scrap paper or slates and show to **T** on command.

Who did the same? Who did it another way? Who made a mistake? What was your mistake? etc.

- **a)** What is 4 times the sum of 176 and 49?
  Show me . . . now! (900)
  e.g. 176 + 49 = 175 + 50 = 225; 225 × 4 = 800 + 100 = **900**

- **b)** What is 4 times the difference between 176 and 49?
  Show me . . . now! (508)
  e.g. 176 – 49 = 177 – 50 = 127; 127 × 4 = 480 + 28 = **508**

- **c)** What is the sum of 176 and 4 times 49?
  Show me . . . now! (372)
  e.g. 49 × 4 = 160 + 36 = 196, or 49 × 4 = 50 × 4 – 4 = 196; 176 + 196 = 276 + 96 = 376 – 4 = **372**

- **d)** What is the difference between 4 times 176 and 49?
  Show me . . . now! (655)
  e.g. 176 × 4 = 400 + 280 + 24 = 680 + 24 = 704; 704 – 49 = 705 – 50 = **655**

**14 min**

### 3. Multiplication practice

**T** has numbers already written on BB.

**BB:**

- \( \{ \text{108, 247, 319} \} \)
- \( \{ \text{3, 4} \} \)

- **a)** Let’s write multiplications using a number from *Set A* and a number from *Set B*. **Ps** come to BB or dictate what **T** should write.
  e.g. 108 × 3 = 247 × 3 = 313 × 3 = 108 × 4 = 247 × 4 = 319 × 4 =

- **b)** Which would give the smallest product? (108 × 3 = 324)

- **c)** Which would give the greatest product? (319 × 4 = 1276)

- **d)** Which would give an even number as the product?
  108 × 3 \( \rightarrow \, \boxed{108 \times 4 \rightarrow \boxed{247 \times 4 \rightarrow \boxed{319 \times 4 \rightarrow \boxed{5}}} \)

Agree that any number times an even number \( \rightarrow \) an even product.

**14 min**

---

**Lesson Plan**

**Week 4**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boom!</td>
<td>Whole class activity at speed in order round class. Ps who make a mistake sit down and the next P corrects their mistake. Class points out mistake if next P misses it. In good humour! Class applauds Ps still standing at the end.</td>
</tr>
<tr>
<td>Calculation practice</td>
<td>Whole class activity but individual work in <em>Ex. Bks</em>. Give Ps time to do calculations/write answers. Responses shown in unison. Reasoning, agreement, praising Accept any correct method of calculation. e.g. a) ( \boxed{2 \times 2 = 5 \times 4} ) ( \boxed{9 \times 0 = 10} ) ( \boxed{2 \times 2} ) b) ( \boxed{1 \times 7 \times 6 \times 4} ) ( \boxed{7 \times 0 = 14} ) ( \boxed{3 \times 2} ) Extra praise for 'quick' ways. Feedback for <strong>T</strong></td>
</tr>
<tr>
<td>Multiplication practice</td>
<td>Whole class activity BB or SB already prepared Agreement, praising Smallest multiplicand and the smallest multiplier Greatest multiplicand and the greatest multiplier Only the units digit needs to be considered.</td>
</tr>
</tbody>
</table>
Activity

3 (Continued)

e) Which would give an odd number as the product?

\[247 \times 3 \rightarrow \boxed{1}\]
\[313 \times 3 \rightarrow \boxed{9}\] (Odd \times odd \rightarrow odd product)

f) Which numbers in Set A are divisible by 3? (108, as 108 = 90 + 18)

\[(247 = 240 + 6 + 1) \text{ and } 319 = 300 + 18 + 1, \text{ so not divisible by 3}\]

g) Which numbers in Set B are divisible by 4? (108, as 108 = 100 + 8)

(\text{the other two numbers are odd, so are not divisible by 4})

Notes

Only the units digit needs to be considered.

Ps might want to do all the divisions in long or short form to check.

Whole class activity

(If some Ps wish to try the first 3 statements individually, let them)

Written on BB or SB or OHT

At a good pace

Results of operations can be written above the operation signs or in a new line as shown here.

Discussion, reasoning, agreement, (self-correction if done individually), praising

T will probably need to help with \(d\).

Demonstrate on class number line if problems.

5

PB4a, page 18, Q.1

Read: Which numbers can be written instead of the letters?

Deal with one at a time. Class reads each statement in unison. Ps suggest which operation to do first and how to continue. Ps come to BB to do calculations, explaining reasoning. Class points out errors.

Solution:

\[
\begin{align*}
157 \times 3 + a &= 196 + 285 \\
471 + a &= 481 \\
a &= 481 - 471 \\
&= 10 \\
b + 136 \times 2 &= 640 \div 8 + 292 \\
b + 272 &= 372 \\
b &= 372 - 272 \\
&= 100 \\
376 + 287 &\leq c - 126 \leq 134 \times 5 \\
663 &\leq c - 126 \leq 670 \\
789 &\leq c \leq 796 \\
c: 789, 790, 791, 792, 793, 794, 795, 796 &+ 112 \\
&= 891 \\
364 \div 7 + 100 &< 160 - d < 55 \times 3 - 8 \\
52 + 100 &< 160 - d < 165 - 8 \\
152 &< 160 - d < 157 \\
d: 7, 6, 5, 4 &
\end{align*}
\]

PB4a, page 18

Q.2 Read: One quarter of a path has already been paved. How much has been done if the whole path is 792 m long?

Elicit that the shaded part in the diagram is the part already paved.

Review at BB with whole class. Ps come to BB to write plan, estimate, calculate, check and write the answer as a sentence. Class points out errors. Mistakes discussed and corrected.

Solution:

Plan: 792 m \div 4

Estimation: 800 \div 4 = 200

Answer: 198 m has been paved.

Individual work, monitored, helped

Drawn on BB or use enlarged copy master or OHP

Reasoning, agreement, self-correction, praising

Check:

What fraction of the path has not been paved yet?

(3 quarters)
### Lesson Plan 18

#### Activity

**PbY4a, page 18**

Q.3 Read: *Pete can cycle 4 m in one second. How long will it take Pete to cycle: a) 760 m, b) 380 m, c) 1520 m?*

Set a time limit. Ps can use any correct form of calculation. Review at BB with whole class. Ps explain their solutions on BB. Who did the same? Who did it another way? etc. Mistakes discussed and corrected.

**Solution:** e.g.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>9</th>
<th>0</th>
<th>2</th>
<th>4</th>
<th>3</th>
<th>8</th>
<th>0</th>
<th>4</th>
<th>1</th>
<th>5</th>
<th>2</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4</td>
<td>7</td>
<td>6</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- a) 760 m
- b) 380 m
- c) 1520 m

If no P has done so, T could elicit another way to obtain solutions to b) and c) using direct proportion. T draws arrows. Extra praise if Ps noticed relationships without hints from T.

**Notes:**

- Individual work monitored, helped
- Differentiation by time limit
- Discussion, reasoning, agreement, self-correcting, praising
- or, e.g.
  - 760 m ÷ 4 m
  - = (400 m + 360 m) ÷ 4 m
  - = 100 + 90 = 190 (times)
- Revise direct proportion.
  - [If one value (i.e. dividend) increases (decreases) by a certain number of times, another value (i.e. quotient) also increases (decreases) by that number of times.]

#### Notes

Individual work monitored, helped

(or whole class activity if time is short)

Written on BB or use enlarged copy master or OHT

Discussion, reasoning, agreement, self-correcting, praising

or, e.g.

- 708 ÷ 2 = (600 + 108) ÷ 2
  - = 300 + 54 = 354
- 354 ÷ 3
  - = (300 + 30 + 24) ÷ 3
  - = 100 + 10 + 8 = 118
  - etc.
**Activity 1**

**Find the mistakes**

Mr. Silly has done these calculations! What do you think of them? Are they correct? How can we check? Could the layout be better?

Ps come to BB to try to explain Mr Silly's reasoning, find any mistakes, say what he has done wrong and write the operation again correctly. Class agrees/disagrees.

BB: e.g.

<table>
<thead>
<tr>
<th>Operation</th>
<th>Result</th>
<th>Correct?</th>
</tr>
</thead>
<tbody>
<tr>
<td>$7 \times 2 - 5 + 3$</td>
<td>10</td>
<td>✔</td>
</tr>
<tr>
<td>$15 \div 3$</td>
<td>5</td>
<td>✔</td>
</tr>
<tr>
<td>$1 \times 2 + 3$</td>
<td>5</td>
<td>✔</td>
</tr>
<tr>
<td>$2 \times 3 - 1$</td>
<td>5</td>
<td>✔</td>
</tr>
<tr>
<td>$4 \times 3 + 2$</td>
<td>14</td>
<td>✔</td>
</tr>
</tbody>
</table>

Correct (but very long!)

Check:

<table>
<thead>
<tr>
<th>Operation</th>
<th>Result</th>
<th>Correct?</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1 \times 3 \times 7$</td>
<td>21</td>
<td>✔</td>
</tr>
<tr>
<td>$9 \times 4 \div 3$</td>
<td>12</td>
<td>✔</td>
</tr>
<tr>
<td>$9 \times 4 \div 3$</td>
<td>12</td>
<td>✔</td>
</tr>
</tbody>
</table>

**Notes**

Whole class activity

(Ps may do calculations in *Ex. Bks.* first if they wish)

Written on BB or use enlarged copy master or OHP

At a good pace

Reasoning, agreement, praising

Accept any form of correct calculation with correct reasoning.

or

e) $817 \div 8 = 12, r 1$

Check:

```
1 0 2
8 8 1 7
```

= $100 + 2, r 1$

= $102, r 1$

Feedback for T

**Activity 2**

**Number sets**

Let's write the numbers from 0 to 20 in the correct place in the set diagrams.

Deal with one part at a time. Ps come to BB one after the other to write a number, explaining reasoning. Class agrees/disagrees.

BB:

<table>
<thead>
<tr>
<th>Divisible by 8</th>
<th>Not divisible by 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 8 16 1 2 3 4 5 6 7 9 10 11 12 13 14 15 17 18 19 20</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Divisible by 5</th>
<th>Not divisible by 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 5 10 1 2 3 4 6 7 8 9 11 12 13 14 16 17 18 19</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Divisible by 8</th>
<th>Not divisible by 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 16 1 2 3 4 6 7 9 11 12 13 14 17 18 19</td>
<td></td>
</tr>
</tbody>
</table>

(48, 112) (101, 533)

<table>
<thead>
<tr>
<th>Divisible by 5</th>
<th>Not divisible by 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 5 10 1 2 3 4 6 7 8 9 11 12 13 14</td>
<td></td>
</tr>
</tbody>
</table>

(40, 240) (70, 95)

T chooses Ps at random.

Agreement, praising

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Activity

Problems

Listen carefully and think how you would work out the answer.

a) **How much will 8 bars of chocolate cost if 2 of the same bars cost £1.22?**

Ps come to BB or dictate to T. Who agrees? Who would do it another way? etc. T summarises by writing out as below.

BB: 2 bars \( \rightarrow \) £1.22 = 122 p

1 bar \( \rightarrow \) 122 p \( \div \) 2 = 61 p

8 bars \( \rightarrow \) 122 p \( \div \) 2 \( \times \) 8 = 61 p \( \times \) 8 = 488 p = £4.88

T highlights the combined operations as a one-line plan.

Or by using direct proportion:

BB:

\[
\begin{array}{c}
\times 4 \\
\text{2 bars} \rightarrow 122 p \\
\times 8 \rightarrow 488 p
\end{array}
\]

Answer: 8 bars of chocolate will cost £4.88.

b) **How much will 9 packets of sweets cost if 3 of the same packets of sweets cost £3.06?**

Who can write the operations in one line? Who can show it using direct proportion?

BB: 3 packets £3.06 = 306 p

9 packets 306 p \( \div \) 3 \( \times \) 9 = 102 p \( \times \) 9 = 918 p = £9.18

Or by using direct proportion:

9 packets are 3 times 3 packets, so will cost 3 times as much as 3 packets.

BB: 306 p \( \times \) 3 = 918 p = £9.18

Answer: 9 packets of sweets will cost £9.18.

Lesson Plan 19

Notes

Whole class activity

Initial discussion about different methods of solution.

Involve several Ps.

At a good pace

Reasoning, agreement, praising

T writes out again only if Ps have not done so clearly

If Ps do not suggest this way, T elicits or demonstrates it.

Ps say answer as a sentence.

Individual work, monitored, helped

Drawn on BB or use enlarged copy master or OHP

Discussion, reasoning, agreement, self-correcting, praising

Why are there no dots on the remainder 5 line?

(e.g. Because if you had a remainder of 5 you would be at the next multiple of 5 which is already shown on the line for remainder 0.)

Solution:

<table>
<thead>
<tr>
<th>Remainder after dividing by 5</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>201</td>
<td>202</td>
<td>203</td>
<td>204</td>
<td></td>
</tr>
<tr>
<td>205</td>
<td>206</td>
<td>207</td>
<td>208</td>
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<td>210</td>
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<td>212</td>
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<tr>
<td>215</td>
<td>216</td>
<td>217</td>
<td>218</td>
<td>219</td>
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<tr>
<td>220</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Activity 5

**PbY4a, page 19, Q.2**

Read: Helen had 952 stamps. She gave 278 stamps to Sam.

a) How many stamps did Helen have left?  
   Complete the calculation.

Ps come out to BB to point to relevant data and complete the middle subtraction, explaining reasoning. Class agrees/disagrees. Ps write the result in Pbs too.

BB:

```
   952
-  278
---
   674
```

Read: b) How many stamps would she have left if she had at first

i) 200 stamps less?

Which calculation is this? Should we follow the arrows pointing to the right or to the left? Ps come to BB to point to relevant arrows, to write the LH subtraction, explaining reasoning and to write operation above lower arrow. Class agrees/disagrees. Ps write the result in Pbs.

BB:

```
   952
-  278
---
   674
```

Read: b) How many stamps would she have left if she had at first

ii) 100 stamps more?

Ps come to BB to point to relevant arrows, to write the subtraction, on RHS, explaining reasoning and to write operation above lower arrow. Class agrees/disagrees. Ps write the result in Pbs too.

**Solution:**

How many stamps would Helen have left if she had given Sam:

i) 200 less stamps  
ii) 100 more stamps?

Ps come to BB to write calculations and operations above arrows. Class agrees/disagrees.

BB:

```
   952
-  278
---
   674
```

### Extension

**How many stamps would Helen have left if she had given Sam:**

i) 200 less stamps  
ii) 100 more stamps?

Ps come to BB to write calculations and operations above arrows. Class agrees/disagrees.

BB:

```
   952
-  278
---
   674
```

### Notes

Whole class activity  
Drawn on BB or use enlarged copy master or OHP  
At a good pace  
Reasoning, agreement, praising  
Extra praise if Ps realise that only one subtraction needs to be done properly – the other results can be obtained mentally.

Drawn on BB or use enlarged copy master or OHP  
Reasoning, agreement, praising  
(Or Ps calculate mentally and show results to T on scrap paper or slates in unison on command.)
Activity

6  PbY4a, page 19

Q.3  Read: Fill in the missing numbers.

Set a time limit. Ps can write necessary calculations in Ex. Bks. Remember to check your result by doing the completed calculation again mentally.

Review at BB with whole class. Ps come to BB or dictate results to T, explaining how they worked out the answer. Who agrees? Who did it a different way? etc. (e.g. using reverse calculation or trial and error or noticing connections or by estimation.)

If problems, show details of reverse calculation on BB. Mistakes discussed and corrected.

Solution:

\[
\begin{array}{c}
496 + 281 &= 777 \\
381 + 415 &= 834 \\
41 - 41 &= 0 \\
8 - 8 &= 0 \\
\end{array}
\]

\[
\begin{array}{c}
233 \times 3981 &= 461227 \\
4 \times 508 &= 2032 \\
511 &= 108 \\
281 &= 34 \\
449 &= 505 \\
\end{array}
\]

\[
\begin{array}{c}
2 \times 127 &= 254 \\
4 \times 508 &= 2032 \\
\end{array}
\]

Whole class activity

Notes

Individual work, monitored, helped

Written on BB or use enlarged copy master or OHP

Differentiation by time limit

Discussion, reasoning, agreement, self-correction, praising

Extra praise if Ps notice relationships which make calculations easier, e.g.

d) \( \rightarrow 3 \times a) \\
g) \rightarrow 2 \times f) \\
h) \rightarrow 3 \times f) \\
j) \rightarrow f) \div 3 \\

Stand up if you had all correct! Let’s give them ‘3 cheers’!
Tables practice, revision, activities, consolidation  

*PbY4a, page 20*

**Solutions:**

Q.1  
   a) $164 \times 4 = 400 + 240 + 16 = 656$  
   b) $164 \div 4 = 41$  
   c) $456 \div 4 = 400 \div 4 + 40 \div 4 + 16 \div 4$  
      = $100 + 10 + 4 = 114$  
   d) $456 \times 4 = 1600 + 200 + 24 = 1824$

Q.2  
   a) $a = 240 - b$  
   b) $a = 240 - a$  
   c) $x = y \div 7$  
   d) $y = x \times 7$  

Q.3  
   a) $10 \times 100 < 201 \times 5 < 1005$  
    $25$  
   b) $125 \div 5 \leq 210 \div 7 \leq 25, 26, 27, 28, 29$  
   c) $4 \times 60 - 4 \times 58 > 215$  
   d) $30 \times 10 \leq 912 \div 3 \leq 304$  

Q.4  
   a) $150 \div 7 = 140 \div 7 + 10 \div 7 = 20 + 1, r 3 = 21, r 3$

   The baker can make 21 cakes and he will have 3 eggs left over.
### Y4

<table>
<thead>
<tr>
<th>Activity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Measuring length</strong></td>
<td>Whole class activity</td>
</tr>
<tr>
<td>a) What units does your ruler show? (e.g. cm and mm) What range of lengths can you measure with it? (e.g. 0 cm to 27 cm or 0 mm to 275 mm; or more if we mark, e.g. 20 cm, then move the ruler along) Who can fill in the missing items? Ps come to BB or dictate to T. BB: 1 centimetre = (10) millimetres (1\ cm = 10\ mm) Measure the width of your exercise book. T asks several Ps their result. Ps might give it in different units. T writes on BB. e.g. BB: Width of exercise book: 18 cm 5 mm = 185 mm b) i) What range of lengths can we measure with this metre stick? (0 m to 1 m, or 0 cm to 100 cm, or 0 mm to 1000 mm) ii) What range of lengths can we measure with this tape measure? (e.g. 0 m to 1 and a half m, or 0 cm to 150 cm, or 0 mm to 1500 mm) Let's measure the width of A's desk (the classroom). Ps come to front of class in pairs to choose an appropriate measuring tool, measure and write length on BB. (T should have an idea of what the lengths are beforehand. If the measures are way out, ask another pair of Ps to repeat it.) e.g. BB: Width of: A's desk: 503 mm = 50 cm 3 mm the classroom: 1245 cm = 12 m 45 cm (= 12 450 mm) Who can fill in the missing items? Ps dictate to T or come to BB. Rest of class write in Ex. Bks. too. BB: 1 m = 100 cm = 1000 mm 1 km = 1000 m 1 cm = 10 mm What place is about 1 km from the school? (T should already have one or two in mind, or cite number of times round playground) 10 min</td>
<td></td>
</tr>
<tr>
<td><strong>Measuring capacity</strong></td>
<td>Whole class activity</td>
</tr>
<tr>
<td>What is capacity? (How much liquid a container can hold.) a) Let's measure capacity using non-standard units. (e.g. measuring the capacity of a jug or bottle using a tumbler or glass.) Ps estimate first, then confirm by measuring with water. e.g. BB: 3 glasses &lt; capacity of jug &lt; 4 glasses b) What range of capacity can be measured using this measuring jug (feeding bottle)? e.g. 0 ml to 1000 ml, or 0 cl to 100 cl, or 0 litre to 1 litre. How much water is in this bucket (bottle, etc.)? Ps estimate first, then measure. (e.g. 2 litres, 75 cl, 750 ml, etc.) What is missing? Ps come to BB or dictate to T. BB: 1 litre = 100 cl = 1000 ml 1 cl = 10 ml Ps copy in Ex. Bks. Elicit the relationship between capacity and length. Show it in a diagram or demonstrate with an open-top 10 cm glass cube.</td>
<td></td>
</tr>
<tr>
<td><strong>Week 5</strong></td>
<td></td>
</tr>
</tbody>
</table>
**Activity 3**

Measuring mass

T has various objects to weigh and different sets of scales and weights.

a) Ps come to front of class to measure weights using non-standard units. Ps estimate first. e.g. 2 spoons < a book < 3 spoons

b) What range of units could we measure with these scales? Ps come to BB ro read range and T writes on BB. (e.g. 0 g to 1000 g, or 0 kg to 5 kg)

Ps come to front to estimate mass first then weigh various items using appropriate sets of scales and standard units. Ps write weights on BB.

T could ask various Ps what they weigh, or Ps come to front of class to weigh themselves on bathroom scales and write weights on BB.

What is missing? Ps come to BB or dictate to T.

BB: 1 kg = 1000 g 1 tonne = 1000 kg

Ps copy in Ex. Bks. What kind of things would you weigh in tonnes? (e.g. ships, elephants, transporters, etc. – very heavy things!)

Elicit the relationship between mass, capacity and length.

Ps can demonstrate by filling a 10 cm × 10 cm × 10 cm open-top glass cube with water, pouring it into a litre jug, then pouring it into the container on a set of scales.

BB: 1000 cm cubes (cc) of water → 1 litre → 1 kg

1 cc of water → 1 ml → 1 g

---

**Lesson Plan 21**

**Notes**

Whole class activity

Digital and mechanical scales and balances with various weights: e.g. 1 g, 2 g, 5 g, 10 g, 20 g, 50 g, 100 g, 200 g, 500 g, 1 kg

[T might show Imperial weights too (ounce, lb, stone) and compare with decimal measures.]

At a good pace

Discussion, agreement, praising

Allow Ps to explain it if they can but T should have appropriate measuring tools available for them to use.

T gives hints only if Ps do not remember.

Agreement, praising

---

**4 PbY4a, page 21**

Q.1 Read: Fill in the missing numbers and units. What kind of measures are these? (length) Set a time limit. Review at BB with whole class. Ps dictate results to T or come to BB, explaining reasoning. Mistakes discussed and corrected.

Solution:

a) 3 m 35 cm = 335 cm  

b) 5 m 70 cm = 570 cm

c) 198 cm = 1 m 98 cm  
d) 609 cm = 6 m 9 cm

e) 8 cm 4 mm = 84 mm  
f) 1 m 32 cm 5 mm = 1325 mm

g) 1273 mm = 1 m 27 cm 3 mm  
h) 1905 mm = 1 m 90 cm 5 mm

---

**5 PbY4a, page 21**

Q.2 Read: Fill in the missing numbers and units. What kind of measures are these? (capacity) Set a time limit. Review at BB with whole class. Ps dictate results to T or come to BB, explaining reasoning. Mistakes discussed and corrected.

Solution:

a) 3 litres 42 cl = 342 cl  

b) 6 litres 58 cl = 658 cl

c) 824 cl = 8 litres 24 cl  
d) 703 cl = 7 litres 3 cl

e) 1 litre 63 cl 5 ml = 1635 ml  
f) 1 litre 4 cl 8 ml = 1048 ml

g) 1546 ml = 1 litre 54 cl 6 ml  
h) 1038 ml = 1 litre 3 cl 8 ml

---
**Activity**

6  **PbY4a, page 21**

Q.3  Read:  *Fill in the missing numbers and units.*

What kind of measures are these?  (mass)  Set a time limit.

Review at BB with whole class.  Ps dictate results to T or come to BB, explaining reasoning.  Mistakes discussed and corrected.

Solution:

a)  1 kg 806 g  =  1806 g  

b)  1 kg 257 g  = 1257 g

c)  1300 g  =  1 kg 300 g  

d)  1604 g  =  1 kg 604 g

e)  1320 g  =  1 kg 320 g

f)  1001 g  =  1 kg 1 g

g)  1624 g  =  1 kg 624 g

h)  1479 g  =  1 kg 479 g

-- 40 min --

7  **PbY4a, page 21, Q.4**

Read:  *Write plans and do the calculations in your exercise book.*  
*Fill in the answers.*

Deal with one part at a time.  P reads question aloud, 2nd P writes a plan, 3rd P does calculation, 4th P checks it and 5th P says the answer as a sentence.  Throughout, rest of class intervenes if an error is made or if they think of an alternative way to solve it.

Solution:  e.g.

a)  Freddy Frog jumped 120 cm 5 mm, then another 1 m 14 cm 3 mm.  How far did he jump altogether?

Plan:  
1st jump:  120 cm 5 mm  =  1205 mm

2nd jump:  1 m 14 cm 3 mm  = 1143 mm

Total distance jumped:  

\[
\begin{array}{c}
1205 \\
1143 \\
\end{array}
\]

\[= 2347 \text{ mm} = 2 \text{ m } 347 \text{ mm} = 2 \text{ m } 34 \text{ cm } 7 \text{ mm} \]

Answer:  He jumped 2 m 34 cm 8 mm altogether.

b)  Peter Pelican drank 1 litre of 143 ml of water and his son drank 210 ml less.  How much water did his son drink?

Plan:  
P:  1 litre 143 ml  =  1143 ml  
S:  1143 ml – 210 ml

Answer:  His son drank 933 ml (= 93 cl 3 ml) of water.

c)  If one egg weighs 60 g, what is the weight of 31 eggs?

Plan:  
1 egg:  60 g  
31 eggs:  31 \times 60 g

\[C: \quad 31 \times 60 = 1800 \text{ g} + 60 = 1860 \text{ g} \]

1 kg 860 g

Answer:  31 eggs weigh 1 kg 860 g.

d)  Sammy Snail takes 5 minutes to move 1950 mm.  How far can he move in 1 minute?

Plan:  
5 min:  1950 mm  
1 min:  1950 mm ÷ 5

\[C: \quad \frac{1950}{5} = 390 \text{ mm} = 39 \text{ cm} \]

Answer:  He can move 39 cm in 1 minute.  

-- 45 min --

**Notes**

Individual work, monitored, helped

Written on BB or use enlarged copy master or OHP

Differentiation by time limit

Discussion, reasoning, agreement, self-correcting, praising

Feedback for T

Whole class activity

(or individual work if Ps wish, reviewed with whole class)

Discussion, agreement, checking, praising

\[120 \text{ cm} = 1 \text{ m } 20 \text{ cm} \]

\[1 \text{ m } 20 \text{ cm} + 1 \text{ m } 14 \text{ cm} + 3 \text{ mm} \]

\[= (1 + 1) \text{ m} + (20 + 14) \text{ cm} + (3 + 5) \text{ mm} \]

\[= 2 \text{ m } 34 \text{ cm } 8 \text{ mm} \]

or  \[31 \times 60 = 31 \times 6 \times 10 = 186 \times 10 = 1860 \]

\[1950 \div 5 = 1000 \div 5 + 500 \div 5 + 450 \div 5 \]

\[= 200 + 100 + 90 = 390 \text{ (mm)} \]
<table>
<thead>
<tr>
<th><strong>Activity</strong></th>
<th><strong>Notes</strong></th>
</tr>
</thead>
</table>
| **1** Estimating length | Whole class activity  
(T could have some real items to show to class.)  
Inequalities written on BB or use enlarged copy master or OHP  
At a good pace  
Discussion, agreement, praising  
T points to other inequalities  
Ps say them using other units, e.g. 10 cl < \[\text{ ? }\] 20 cl |
| Imagine these things in real life. Estimate their lengths.  
BB:  
| b | \(1\text{ m} < \text{e} < 2\text{ m}\)  
| c | \(2\text{ cm} < \text{b} < 3\text{ cm}\)  
| a | \(10\text{ cm} < \text{a} < 20\text{ cm}\)  
| d | \(4\text{ m} < \text{d} < 5\text{ m}\)  
| c | \(10\text{ m} < \text{c} < 20\text{ m}\)  
P\(s\) come to BB to write letter of item in appropriate inequality. Class agrees disagrees. If problems, check against real measures. |
| **2** Estimating capacity | Whole class activity  
(T could have some real items to show to class.)  
Inequalities written on BB or use enlarged copy master or OHP  
At a good pace  
Discussion, agreement, praising  
T points to other inequalities  
P\(s\) say them using other units, e.g. 10 cl < \[\text{ ? }\] 20 cl |
| Imagine these things in real life. Estimate their capacity  
BB:  
| a | \(1\text{ litre} < \text{f} < 2\text{ litres}\)  
| f | \(80\text{ litres} < \text{e} < 100\text{ litres}\)  
| d | \(10\text{ ml} < \text{d} < 20\text{ ml}\)  
| e | \(100\text{ ml} < \text{e} < 200\text{ ml}\)  
| a | \(800\text{ ml} < \text{a} < 1000\text{ ml}\)  
| f | \(1000\text{ cl} < \text{f} < 2000\text{ cl}\)  
| b | \(5\text{ litres} < \text{b} < 10\text{ litres}\)  
| a | \(80\text{ cl} < \text{a} < 1\text{ litre}\)  
P\(s\) come to BB to write letter of item in appropriate inequality. Class agrees disagrees. Extra praise if P\(s\) notice that 2 inequalities are the same as two others (see joining lines). |
| **3** Estimating mass | Whole class activity  
(T could have real items to show to class.)  
Inequalities written on BB or use enlarged copy master/OHP  
At a good pace  
Discussion, agreement, praising  
Extension  
P\(s\) suggest another item and class agrees on an inequality for it. Check with real weight. |
| Imagine these things in real life. Estimate their mass (weight).  
BB:  
| a | \(900\text{ g} < \text{a} < 1100\text{ g}\)  
| b | \(20\text{ kg} < \text{e} < 40\text{ kg}\)  
| f | \(50\text{ g} < \text{f} < 100\text{ g}\)  
| c | \(50\text{ kg} < \text{c} < 1000\text{ kg}\)  
| d | \(500\text{ g} < \text{d} < 1000\text{ g}\)  
| b | \(100\text{ g} < \text{b} < 200\text{ g}\)  
P\(s\) come to BB to write letter of item in appropriate inequality. Class agrees disagrees. |
### Activity 4

**Time**

What standard units of time do we use? Ps tell what they know. (e.g. seconds, minutes, hours, days, weeks, months, seasons, years)

Let's fill in the missing units. Ps come to BB or dictate to T.

**BB:**
- 1 year = 4 seasons
- 1 year = 52 weeks + 1 or 2 days
- 1 year = 12 months
- 1 week = 7 days
- 1 year = 365 or 366 days
- 1 day = 24 hours
- 1 hour = 60 minutes
- 1 minute = 60 seconds

T informs class (or elicits if T thinks Ps might know):
- Leap years have an extra day (February 29th) so have 366 days.
- Years divisible by 4 are leap years, except the whole hundred years when only every fourth hundred is a leap year.
- When is the next leap year? (2004, as the next year divisible by 4)
- In a non-leap year, 1 January and 31 December are on the same day of the week.
- The year 2000 was the last year of the second millennium (or second thousand years), or the last day of the 20th century.
- 2001 is the first year of the third millennium (or third thousand years), or the first year of the 21st century.
- What was the first day of the 21st century? (1 January 2001, or 01/01/2001)

---

### Activity 5

**What is the time?**

a) T sets a real or model clock and Ps read the time. Encourage other Ps to express the times in different ways.

- e.g. 12 o'clock, 12:00 or 00:00, mid-day (noon) or midnight
- 4 o'clock, 4.00 pm or 4:00 am, 04:00 or 16:00
- 2 minutes to nine, 8.58 am or 8.58 pm, 8:58 or 20:58
- A quarter to 12, 11.45 am or 11.45 pm, 11:45 or 23:45, etc.

b) T (or P) dictates times in different ways. Ps set their model clocks and show to T on command.

---

### Activity 6

**PbY4a, page 22**

Q.1 Read: *Join up the quantities to the tools you would use to measure them.*

Review at BB with whole class. Ps come to BB to draw joining lines. Class agrees/disagrees. Mistakes discussed and corrected.

**Solution:**

- 3 kg 480 g
- 5 hours 15 minutes
- 1 m 52 cm
- 34 cl

**Extension**

T points to a quantity and Ps express it in another way.

- e.g. 3 kg 480 g = 3480 g

---

### Notes

Whole class activity

- T has clock and large calendar on the wall.

Written on BB or use enlarged copy master or OHP

At a good pace

Agreement, praising

- BB: 52 × 7 = 350 + 14 = 364

Feedback for T

Discussion. Involve several Ps. e.g. 2000 was a leap year but 2100 will not be.

T refers to calendar where appropriate.

- BB: 1 century = 100 years
- 1 millennium = 1000 years

Remind Ps of different ways of writing the date.

---

Individual work, monitored

Drawn on BB or use enlarged copy master or OHP

Discussion, agreement, self-correcting, praising

Feedback for T

- e.g. 3 kg 480 g = 3480 g

Agreement, praising
Activity

7  PbY4a, page 22
Q.2 Read: Join up the measures to the matching units.
Review at BB with whole class. Pducers to BB to draw joining lines. Class agrees/disagrees. Mistakes discussed and corrected.
Solution:

- metre - capacity - centilitre
- kilogram - time - minute
- litre - length - gram
- centimetre - mass - day

What other units could be used for each type of measure?

33 min

Extension

8  PbY4a, page 22
Q.3 Read: Fill in the missing numbers and units.
Elicit that there are 14 equations. Set a time limit.
Review at BB with whole class. Pducers to BB or dictate to T. Pducers mark/correct own work and write how many correct out of 14.
Who had 14 correct? Who made 1 mistake (2, 3, 4, more than 4) mistakes? What was your mistake? Who did the same?
Who made a different mistake? etc.
Solution:

a) 439 cm = 4 m 39 cm  12 m 6 cm = 1206 cm
b) 1831 mm = 1 m 83 cm 1 mm  1 m 67 mm = 1067 mm
c) 1210 g = 1 kg 210 g  1 kg 340 g = 1340 g
d) 1942 ml = 1 litre 942 ml  1 litre 86 ml = 1086 ml
e) 11 minutes = 660 seconds  4 hrs 27 min = 267 min
f) 372 seconds = 6 m 12 sec  10 min 40 sec = 640 sec
g) January = 4 weeks 3 days  June = 4 weeks 2 days

40 min

9  PbY4a, page 22
Q.4 Read: Write in the missing numbers. (They need only be approximate.)
Pducers fill in what they can during the rest of the lesson. They can finish it at home if they run out of time.
T chooses Pducers to read out their details. Class decides whether their estimates are realistic or not.
Solution: e.g.

Today’s date: 16 / 10 / 2001
My height: 134 cm = 1 m 34 cm
My weight: 32 kg  Length of my step: 60 cm
My age: 8 years 3 months  Length of my span: 12 cm
I go to bed at: 9.00 pm  Length of my foot: 14 cm
I get up at: 8.00 am  I sleep for: 11 hours per day

45 min
**R:** Calculations up to 1000
**C:** Length, capacity, mass, time. Calculations up to 2000
**E:** Problems

### Activity

#### 1

**Problems**

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

**a)** BB:

![Diagram]

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

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

\[ P = 2 \times (2 \text{ m} + 3 \text{ m} 42 \text{ cm}) = 2 \times 5 \text{ m} 42 \text{ cm} = 10 \text{ m} 84 \text{ cm} \]

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

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

\[ \begin{align*}
    a &= 3 \text{ m} 42 \text{ cm} = 342 \text{ cm} \\
    b &= 2 \text{ m} = 200 \text{ cm}, \text{ so } a > b \\
    a - b &= 342 \text{ cm} - 200 \text{ cm} = 142 \text{ cm} = 1 \text{ m} 42 \text{ cm}
\end{align*} \]

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

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

\[ A = 3 \text{ m} 42 \text{ cm} \times 2 \text{ m} = 3 \text{ m} \times 2 \text{ m} + 42 \text{ cm} \times 2 \text{ m} \\
    = 6 \text{ m}^2 + 42 \text{ cm} \times 200 \text{ cm} \\
    = 6 \text{ m}^2 + 8400 \text{ cm}^2 \\
    = \text{6 m}^2 \text{ 8400 cm}^2 \]

or \[ A = 342 \text{ cm} \times 200 \text{ cm} = 684 \text{ cm} \times 100 \text{ cm} = 68 \text{ 400 cm}^2 \\
    = \text{6 m}^2 \text{ 8400 cm}^2 \]

Because

BB:

![Diagram]

\[ 1 \text{ m} \times 1 \text{ m} = 1 \text{ m}^2 \text{ (1 m square)} \\
    1 \text{ cm} \times 1 \text{ cm} = 1 \text{ cm}^2 \text{ (1 cm square)} \\
    1 \text{ m}^2 = 100 \times 100 \text{ cm}^2 = 10 \text{ 000 cm}^2 \]

**b)** BB:

![Diagram]

\[ \text{£13 20 p} \rightarrow \text{£13 20 p} \]

e.g.

Q.1 *What do 3 balls cost?*

12 balls: £13 20 p = 1320 p

\[ 3 \text{ balls} = \frac{1320 \text{ p}}{12} \times 3 = 110 \text{ p} \times 3 = 330 \text{ p} = \text{£3.30} \text{ p} \]

Or 3 balls = 12 balls ÷ 4, so cost is \[1320 \text{ p} \div 4 = 330 \text{ p} \]

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

---

**Lesson Plan 23**

**Notes**

Whole class activity

Diagrams drawn on BB

T intervenes only if necessary.

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

Reasoning, agreement, praising

or \[ 2 \times 5 \text{ m} 42 \text{ cm} = 2 \times 542 \text{ cm} = 1084 \text{ cm} \]

BB:

![Diagram]

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

T helps with the calculation and reading the result.

T reminds Ps of the notation for 'squares' and explains why \[68 \text{ 400 cm}^2 = 6 \text{ m}^2 \text{ 8400 cm}^2\]

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

### Example

<table>
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or

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</tbody>
</table>

\[ 330 \text{ p} = \text{£3.30} \text{ p} = \text{£3.30} \]
**Y4**

### Activity 2

**Construction**

a) Draw a rectangle in your *Ex. Bks* with sides 4 cm 5 mm and 8 cm.

T draws a rough diagram on BB but Ps measure (or count) accurately in *Ex. Bks* or on grid.

b) Calculate its perimeter and its area.

T sets a time limit. Review at BB with whole class.

Perimeter found individually but area could be done with the whole class.

**Solution:**

- Perimeter: $P = 2 \times (45 \text{ mm} + 80 \text{ mm}) = 2 \times 125 \text{ mm} = 250 \text{ mm} = 25 \text{ cm}$
- Area: $A = 45 \text{ mm} \times 80 \text{ mm} = 3600 \text{ mm}^2$, or $A = 4.5 \text{ cm} \times 8 \text{ cm} = (32 + 4) \text{ cm}^2 = 36 \text{ cm}^2$

### Activity 3

**Missing numbers and units**

Let’s see how quickly we can fill in the missing items!

Ps come to BB to write numbers and units, explaining reasoning and to say completed equation. Class checks mentally whether they are correct.

**BB:**

a) $780 \text{ m} + \boxed{220 \text{ m}} = 1 \text{ km}$  
   $1260 \text{ m} + \boxed{740 \text{ m}} = 2 \text{ km}$

b) $450 \text{ g} + \boxed{550 \text{ g}} = 1 \text{ kg}$  
   $1350 \text{ g} + \boxed{650 \text{ g}} = 2 \text{ kg}$

c) $330 \text{ ml} + \boxed{670 \text{ ml}} = 1 \text{ litre}$  
   $1600 \text{ ml} + \boxed{400 \text{ ml}} = 2 \text{ litres}$

### Activity 4

**PbY3b, page 23**

Q.1 Read: Fill in the missing numbers.

Set a time limit or deal with one row at a time.

Review at BB with whole class. Ps come to BB or dictate to T, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected.

**Solution:**

a) $1500 \text{ m} = \boxed{1 \text{ km}} 500 \text{ m}$  
   $1 \text{ km} 480 \text{ m} = \boxed{1480 \text{ m}}$

b) $1300 \text{ g} = \boxed{1 \text{ kg}} 300 \text{ g}$  
   $1 \text{ kg} 290 \text{ g} = \boxed{1290 \text{ g}}$

c) $1640 \text{ mm} = \boxed{1 \text{ m}} 640 \text{ mm}$  
   $1 \text{ m} 517 \text{ mm} = \boxed{1517 \text{ mm}}$

d) $1240 \text{ ml} = \boxed{1 \text{ litre}} 240 \text{ ml}$  
   $1 \text{ litre} 804 \text{ ml} = \boxed{1804 \text{ ml}}$

e) $640 \text{ minutes} = \boxed{10 \text{ hrs}} 40 \text{ min}$  
   $10 \text{ hrs} 56 \text{ min} = \boxed{656 \text{ min}}$

f) $90 \text{ days} = \boxed{12 \text{ weeks}} 6 \text{ days}$  
   $50 \text{ wks} 6 \text{ days} = \boxed{356 \text{ days}}$
Activity

5  
PbY4a, page 23

Q.2 Elicit that there are $3 \times 4 = 12$ additions and subtractions. Ps can calculate horizontally in Pbs or vertically in Ex. Bks. Deal with one block at a time. Set a time limit. Review at BB with whole class. Ps come to BB or dictate to T, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected.

Solution:

a) $340 \text{m} + 460 \text{m} = 800 \text{m}$
   $950 \text{m} + 320 \text{m} = 1270 \text{m} = 1 \text{km} 270 \text{m}$
   $1 \text{ km} 50 \text{ m} + 406 \text{ m} = 1 \text{ km} 456 \text{ m}$
   $1 \text{ km} 240 \text{ m} - 1040 \text{ m} = 1240 \text{ m} - 1040 \text{ m} = 200 \text{ m}$

b) $810 \text{ ml} + 190 \text{ ml} = 1000 \text{ ml} = 1 \text{ litre}$
   $450 \text{ ml} + 870 \text{ ml} = 1320 \text{ ml} = 1 \text{ litre} 320 \text{ ml}$
   $1 \text{ litre} 310 \text{ ml} + 440 \text{ ml} = 1 \text{ litre} 750 \text{ ml}$
   $1 \text{ litre} 50 \text{ ml} - 200 \text{ ml} = 1050 \text{ ml} - 200 \text{ ml} = 850 \text{ ml}$

c) $157 \text{ g} + 243 \text{ g} = 357 \text{ g} + 43 \text{ g} = 400 \text{ g}$
   $630 \text{ g} + 510 \text{ g} = 1140 \text{ g} = 1 \text{ kg} 140 \text{ g}$
   $1 \text{ kg} 40 \text{ g} + 350 \text{ g} = 1 \text{ kg} 390 \text{ g}$
   $1 \text{ kg} 210 \text{ g} - 430 \text{ g} = 1210 \text{ g} - 430 \text{ g} = 780 \text{ g}$

6  
PbY4a, page 23, Q.3

Read: *Fill in the missing numbers to show how much time has passed.*

How could we do it? (e.g. using a model clock) Ps come to front of class to set the initial time on the model clock and then to move it forward to the finish time. Class counts the hours and minutes. P writes the time passed on the BB and Ps in Pbs.

What other way could we have worked it out? (subtraction) Who would like to show it on the BB? Ps writes subtraction, with T’s help.

BB:

a) $12 \text{ hours 15 min} - 7 \text{ hours 45 min}$
   $= 5 \text{ hours 15 min} - 45 \text{ min}$
   $12 \text{ hrs 15 min} \rightarrow 11 \text{ hrs 75 min}$
   $= 5 \text{ hours} - 30 \text{ min}$
   $- 7 \text{ hrs 45 min}$
   $= 4 \text{ hours 30 min}$
   $4 \text{ hrs 30 min}$

Ps come to BB to use whichever method they prefer to work out the missing times, explaining reasoning (with T’s help if necessary). Class points out errors or easier ways to calculate.

Solution:

a) $7 \text{ hours 45 min}$ to $12 \text{ hours 15 min}$: $4 \text{ hours 30 min}$

b) $15 \text{ hours 30 min}$ to $17 \text{ hours 50 min}$: $2 \text{ hours 20 min}$

c) $6.30 \text{ am}$ to $2.40 \text{ pm}$: $8 \text{ hours 10 min}$

d) $08 : 40 : 00$ to $15 : 10 : 00$: $6 \text{ hours 30 min}$

e) $10 : 25 : 00$ to $14 : 40 : 00$: $4 \text{ hours 15 min}$

f) $2 : 10 : 00$ to $3 : 20 : 00$: $1 \text{ hour 10 min}$

Extension
T points to a time and Ps express it in another way.

45 min

Notes

Individual work, monitored, helped
Written on BB or use enlarged copy master or OHP
Differentiation by time limit
Reasoning, agreement, self-correction, praising

Deals of vertical calculations written on BB if needed, e.g.

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<th>c)</th>
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</tr>
<tr>
<td>7</td>
<td>8</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Whole class activity
(if some Ps wish to try it individually, let them)
Written on BB or SB or use enlarged copy master or OHT
Discussion on methods of solution (e.g. practically, or ‘counting on’ or subtraction)
Ps might start vertical subtraction, then need T’s help to complete it.
Reasoning, agreement, praising

c) $2.40 \text{ pm} \rightarrow 14 \text{ hrs 40 min}$

$6.30 \text{ am} \rightarrow 6 \text{ hrs 30 min}$

Difference: $8 \text{ hrs 10 min}$

d) $15 \text{ hrs 10 min} \rightarrow 14 \text{ hrs 70 min}$

$- 8 \text{ hrs 40 min}$

$- 8 \text{ hrs 40 min}$

$6 \text{ hrs 30 min}$

f) if both are am or both pm!
<table>
<thead>
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<th>Activity</th>
<th>Notes</th>
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<tbody>
<tr>
<td><strong>Week 5</strong></td>
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</table>

**Lesson Plan 24**

**R:** Mental calculation  
**C:** Measurement: time  
**E:** Numbers up to (and beyond) 2000

### 1. Which is more?

Let’s compare them and draw arrows pointing towards the one which is more. Ps come to BB to draw arrows. Class points out errors.

- **BB:**
  - a) 1 kg 700 g → 1770 g → 980 g → 1077 g
  - b) 3 m 45 cm → 350 mm → 400 cm → 3 m 80 mm

What do you notice? (e.g. 6 arrows, 3 pointing towards the biggest quantity, 2 towards the 2nd biggest, 1 towards the 2nd smallest; the smallest quantity has only arrows pointing away from it)

**5 min**

### 2. Which belongs?

Which of these quantities belongs to which food?

Ps come to BB to draw joining lines or to cross out unrealistic quantities, explaining reasoning. Class agrees/disagrees.

- **BB:**
  - glass of milk: (mass) 30 g, (capacity) 200 ml, (thickness) 1 cm
  - slice of bread: (mass) 200 g, (capacity) 200 ml, (thickness) 3 cm

(Ps might say, e.g., that they can eat a slice of bread or drink a glass of milk in 5 minutes; or that in Giant’s Land a glass could hold 4 litres of milk and a slice of bread could weigh 3 kg and measure 130 cm long!)

**10 min**

### 3. Time

Write the answers to these questions in your Ex. Bks. Use suitable units of time. The times need only be approximate or you could give a range if you are unsure.

Review answer after every question. Deal with all cases.

- a) How long do you sleep each day? (e.g. 8 to 11 hours)
- b) How long is the school’s Easter break? (e.g. 2 weeks)
- c) How long is half a year? (e.g. 6 months; 26 weeks; 182 and a half days)
- d) How much time does it take you to get to school? (various answers)
- e) How long is your maths lesson? (e.g. 45 minutes; 3 quarters of an hour)
- f) How much time does it take you to run 100 m? (e.g. 20 seconds, half a minute, etc.)

Ps can think of question too!

**15 min**
### Activity

#### PbY4a, page 24

**Q.1** Read: *Write a plan. Do the calculation in your exercise book. Write the answer*

Deal with one part at a time. Ps read question themselves, write a plan in Pbs, do calculation in Ex. Bks. and write answer in Pbs.

Review with whole class. T asks several Ps for their answer. A, come and tell us how you worked it out. Who did the same? Who did it a different way? etc. Mistakes discussed/corrected.

**Solution:**

<table>
<thead>
<tr>
<th>a)</th>
<th>A ball bearing weighs 30 g. What is the weight of 451 ball bearings?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan:</td>
<td>$30 \times 451$</td>
</tr>
<tr>
<td>C:</td>
<td>$3 \times 4510 = 13530$ (g)</td>
</tr>
<tr>
<td>Answer:</td>
<td>They weigh 13 kg 530 g.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>b)</th>
<th>A snail moves at a speed of 6 cm per minute. How far will it have gone after 3 hours 7 minutes?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan:</td>
<td>$(3 \times 60 + 7) \times 6$</td>
</tr>
<tr>
<td>C:</td>
<td>$187 \times 6 = 1122$ cm</td>
</tr>
<tr>
<td>Answer:</td>
<td>It will have gone 11 m 22 cm.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>c)</th>
<th>Grandma made 17 litres of tomato sauce and poured it into 70 cl bottles. How many bottles did she fill?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan:</td>
<td>$(17 \times 100) \div 70$</td>
</tr>
<tr>
<td>C:</td>
<td>$1700 \div 70 = 24, r 2$</td>
</tr>
<tr>
<td>Answer:</td>
<td>She filled 24 bottles.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>d)</th>
<th>Mum bought 14 m 36 cm of material and made 4 tablecloths, all the same size. How much material did she use for each tablecloth?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan:</td>
<td>$14 \div 4$</td>
</tr>
<tr>
<td>C:</td>
<td>$359$ cm</td>
</tr>
<tr>
<td>Answer:</td>
<td>Mum used 3 m 59 cm for each tablecloth.</td>
</tr>
</tbody>
</table>

| 25 min |

---

**Notes**

Individual work, monitored, helped
(starred questions can be done with whole class if T thinks they are too difficult)
Reasoning, agreement, self-correction, praising

---

**Lesson Plan 24**

**Week 5**

---

**Activity**

#### PbY4a, page 24, Q.2

**Read:** *Mary had a length of ribbon which measured 9 m 24 cm. She cut 4 pieces from it, each 124 cm long. What length of ribbon was left?*

What has the diagram to do with the question? How can we solve it? Ps come to BB to explain diagram and suggest methods of solution. Class agrees/disagrees or offers alternative methods.

e.g Length of ribbon: $9 \times 24 = 924$ cm

Length cut off: $4 \times 124$ cm

Length left: $924 - 4 \times 124 = 924 - 496$ cm

$= 428$ cm $= 4 m 28$ cm

T writes new information on diagram as it is calculated.

**Answer:** 4 m 28 cm of ribbon remained.

| 30 min |

---

**Notes**

Whole class activity
(or individual work if Ps prefer)
Diagram drawn on BB.
Reasoning, agreement, praising

**C:**

| 924 cm |

496 cm

$(4 \times 124)$

428 cm
Q.3 Read: A train travels at a speed of 20 m per second on average. Complete the table.

Discuss what 'on average' means. (The train might slow down in places and speed up in others but if we take the total distance for each journey and divide it by the total time taken, then we get an average speed, as if the train was travelling at the same speed every second.)

Deal with one table at a time. (Results from table a) will help with table b). Necessary calculations done in Ex. Bks.

Review at BB with whole class. Ps come to BB or dictate to T, explaining reasoning. Mistakes discussed and corrected.

Extra praise if Ps notice connections in and between tables to make calculations easier.

Solution:

<table>
<thead>
<tr>
<th>Journey time</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 seconds</td>
<td>600 m</td>
</tr>
<tr>
<td>1 minute</td>
<td>1200 m</td>
</tr>
<tr>
<td>1 and a half minutes</td>
<td>1800 m</td>
</tr>
<tr>
<td>50 seconds</td>
<td>1000 m</td>
</tr>
<tr>
<td>45 seconds</td>
<td>900 m</td>
</tr>
</tbody>
</table>

b)

<table>
<thead>
<tr>
<th>Distance</th>
<th>Journey time</th>
</tr>
</thead>
<tbody>
<tr>
<td>120 metres</td>
<td>6 seconds</td>
</tr>
<tr>
<td>200 metres</td>
<td>10 seconds</td>
</tr>
<tr>
<td>600 metres</td>
<td>30 seconds</td>
</tr>
<tr>
<td>1200 metres</td>
<td>60 seconds</td>
</tr>
<tr>
<td>2000 metres</td>
<td>100 seconds</td>
</tr>
</tbody>
</table>

Q.4 Read: One litre of oil has mass 900 g. Complete the table.

Elicit that: BB: 1 litre = 100 cl = 1000 ml

Ps come to BB to choose a column and work out the missing quantity, explaining reasoning in detail. Difficult calculations done at side of BB if necessary. Class agrees/disagrees or suggests an easier way to calculate. Ps complete table in Pb's too.

Solution:

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Mass</th>
<th>(11 litres 50 cl)</th>
<th>(20 cl)</th>
<th>(1 litre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 cl</td>
<td>90 g</td>
<td>3 × 90 g</td>
<td>11 × 900 g</td>
<td>900 g ÷ 2</td>
</tr>
<tr>
<td>3 cl</td>
<td>270 g</td>
<td></td>
<td></td>
<td>11 × 900 g</td>
</tr>
<tr>
<td>15 cl</td>
<td>10350 g</td>
<td>1800 g</td>
<td>180 g</td>
<td>9 kg</td>
</tr>
<tr>
<td>10 litres</td>
<td></td>
<td>2 litres</td>
<td>9000 g</td>
<td>900 g ÷ 2</td>
</tr>
<tr>
<td>10 litres</td>
<td></td>
<td>2 litres</td>
<td>1000 ml</td>
<td>9000 g</td>
</tr>
</tbody>
</table>

Extension

What is the rule? Check with easy values from the table. Note how the equations change according to the units used.

Rule: e.g.

\[ M \text{ (g)} = C \text{ (cl)} \times 9 \]

\[ C \text{ (cl)} = M \text{ (g)} ÷ 9 \]

\[ C \text{ (ml)} = M \text{ (g)} ÷ 9 \times 10 \]
### Activity

Tables practice, revision, activities, consolidation  
*PbY4a, page 25*

### Solutions:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Q.1</strong></td>
<td></td>
</tr>
</tbody>
</table>
| a) | 275 m + 420 m = 695 m  
821 cm + 275 cm = 1096 cm = 10 m 96 cm  
1 km 75 m – 620 m = 1075 m – 620 m = 455 m  
427 m + 720 m = 1147 m = 1 km 147 m  
72 mm + 99 mm = 171 mm = 17 cm 1 mm |
| b) | 27 cl + 1260 cl = 1287 cl = 12 litres 87 cl  
1 litre 27 cl – 47 cl = 127 cl – 47 cl = 80 cl  
1 litre 226 ml + 874 ml = 1 litre 1100 ml = 2 litres 10 cl  
1257 ml + 874 ml = 2131 ml = 2 litres 131 ml  |
| **Q.2** |   |
| a) | 275 m + 420 m = 695 m  
821 cm + 275 cm = 1096 cm = 10 m 96 cm  
1 km 75 m – 620 m = 1075 m – 620 m = 455 m  
427 m + 720 m = 1147 m = 1 km 147 m  
72 mm + 99 mm = 171 mm = 17 cm 1 mm |
| b) | 27 cl + 1260 cl = 1287 cl = 12 litres 87 cl  
1 litre 27 cl – 47 cl = 127 cl – 47 cl = 80 cl  
1 litre 226 ml + 874 ml = 1 litre 1100 ml = 2 litres 10 cl  
1257 ml + 874 ml = 2131 ml = 2 litres 131 ml |
| **Q.3** |   |
| SL | 93 m,  
ET | 93 m + 207 m = 300 m  
The Eiffel Tower is 300 m high.  |
| **Q.4** |   |
| (332 – 12) ÷ 8 = 320 ÷ 8 = 40  
There will be 40 chairs in each row.  |
Y4

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

Lesson Plan

Week 6

Activity

1 Number analysis

Let’s fill in this table. What do you think it means? If no P understands it, T does first column as a model for Ps to follow. Ps come to BB to complete the remaining columns. Class points out errors.

BB:

<table>
<thead>
<tr>
<th>Number</th>
<th>1834</th>
<th>1496</th>
<th>1509</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digit value</td>
<td>1</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>Place value</td>
<td>1Th</td>
<td>8H</td>
<td>3T</td>
</tr>
<tr>
<td>Real value</td>
<td>1000</td>
<td>300</td>
<td>30</td>
</tr>
</tbody>
</table>

Repeat with other 4-digit numbers suggested by Ps.

4 min

2 PbY4a, page 26

Q.1 Read: Complete the table. Follow the example.

Let’s see if you can complete this table by yourselves!

Review at BB with whole class. Ps come to BB or dictate to T. Class agrees/disagrees. Mistakes discussed and corrected.

Solution:

<table>
<thead>
<tr>
<th>Number</th>
<th>1978</th>
<th>1083</th>
<th>1803</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digit value</td>
<td>1</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>Place value</td>
<td>1Th</td>
<td>9H</td>
<td>7T</td>
</tr>
<tr>
<td>Real value</td>
<td>1000</td>
<td>900</td>
<td>70</td>
</tr>
</tbody>
</table>

8 min

3 Mental calculation

Write these numbers one below the other in your Ex. Bks. Make sure that the place values line up! T dictates numbers, e.g.

1231

68

904

360

• Add the 1st, 2nd and 4th numbers. Show me . . . now! (1659)

• Subtract the 4th number from the 1st number. Show me . . . now! (871)

• Divide the 2nd number by 4 and add the result to the 3rd number. Show me . . . now! (921)

etc.

13 min

Notes

Whole class activity

Drawn on BB or use enlarged copy master or OHP

At a good pace

Reasoning, agreement, praising

Let’s read the numbers together.

Feedback for T

Individual work, monitored, helped

Drawn on BB or use enlarged copy master or OHP

Reasoning, agreement, self-correcting, praising

Whole class activity

Ps write numbers in Ex. Bks. to keep them in mind.

Responses shown in unison.

Ps answering correctly explain how they did the calculation.

In good humour!

Praising, encouragement only

Ps can think of calculations too!
**Y4**

**Activity**

4  
**Number line**

a) Let's join up each number to its approximate position on the number line. Ps come to BB to say the number, point to its place on the number line and draw joining line. Class agrees/disagrees.

b) Let's write the next smaller and greater units, tens and hundreds for each number. Ps come to BB or dictate to T. Class points out errors.

c) T points to each original number in turn. What is this number rounded to the nearest 10 (100)? Ps come to BB or dictate to T. Class points out errors. (Numbers could be coloured or starred.)

**BB:**

```
0 100 200 300 400 500 600
74 185 375 408 591
```

Next smaller 100  Next smaller 10  Next smaller unit  Next greater unit  Next greater 10  Next greater 100

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

20 min

5  
**PbY4a, page 26**

Q.2 Read:  

a) *Join up the numbers to their approximate position on the number line.*

b) *Write the next smaller and greater whole tens and hundreds in the boxes.*

Set a time limit. Review at BB with whole class. Ps come to BB or dictate to T. Class agrees/disagrees. Mistakes discussed and corrected.

For each middle number, colour the nearest ten red and the nearest hundred yellow. Review with whole class.

**Solution:**

a)  

```
400 500 600 700 800 900 1000 1100
423 507 685 751 892 977 1089
```

b)  

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

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### Activity 6

#### Sequences

T says first few terms and also writes them on BB. Ps may do calculations on slates or scrap paper if they cannot do them mentally. Ps dictate the following terms and T writes on BB. Class points out errors. What is the rule? e.g.

a) 18, 36, 72, (144, 288, 576, 1152, . . .)  \( \textbf{Rule: } \times 2 \)

b) 10, 5, 20, 10, 30, 15, (40, 20, 50, 25, 60, 30, 70, 35, 80, 40, 90, 45, 100, 50, . . .)

Elicit that this is a combination of 2 sequences:

- \( a_1, a_3, a_5, \ldots \) 10, 20, 30, 40, . . .  \( \textbf{Rule: } + 10 \)
- \( a_2, a_4, a_6, \ldots \) 5, 10, 15, 20, 25, . . .  \( \textbf{Rule: } + 5 \)

c) 70, 140, 210, (280, 350, 420, 490, 560, 630, 700, 770, 840, . . .)  \( \textbf{Rule: } + 70, \) or the multiples of 70 starting at 70

How could we work out what the 20th term would be? Ask several Ps what they think. (BB: \( a_{20} = 70 + 19 \times 70 = 1400 \))

How could we have worked out the 8th term without writing all the terms before it? T asks several Ps what they think. Let’s check it! (BB: \( a_8 = 1900 \) – 7 \( \times \) 250 = 1900 – 1750 = 150)

d) 1900, 1650, 1400, (1150, 900, 650, 400, 150, –100, –350, –600, . . .)  \( \textbf{Rule: } – 250 \)

How could we have worked out the 8th term without writing all the terms before it? T asks several Ps what they think. Let’s check it! (BB: \( a_8 = 1900 – 7 \times 250 = 1900 – 1750 = 150 \))

### Extension

#### PbY4a, page 26

**Q.3** Read: *Continue the sequences.*

Deal with one part at a time. Set a time limit. Ps do necessary calculations in Ex. Bks.

Review at BB with whole class. Ps dictate terms to T. Mistakes discussed and corrected. Discussion on the rule.

**Solution:**

a) 1024, 512, 256, (128, 64, 32, 16, 8, 4, 2, 1), [1 half, 1 quarter, 1 eighth, 1 sixteenth, . . .]  \( \textbf{Rule: } \div 2 \)

b) 10, 5, 20, 10, 40, 20, (80, 40, 160, 80, 320, 160, . . .)  \( \textbf{Rule: } \div 2, \) then \( \times 4, \)

\( \text{or combination of 2 sequences:} \)

- \( a_1, a_3, a_5, \ldots \) 10, 20, 40, . . .  \( \textbf{Rule: } \times 2 \)
- \( a_2, a_4, a_6, \ldots \) 5, 10, 20, . . .  \( \textbf{Rule: } \times 2 \)

c) 520, 640, 760, (880, 1000, 1120, 1240, 1360, 1480, . . .)  \( \textbf{Rule: } + 120 \)

d) 900, 789, 678, (567, 456, 341, 230, . . .)  \( \textbf{Rule: } – 111 \)

e) 1, 4, 16, 64, (256, 1024), [4096, . . .]  \( \textbf{Rule: } \times 4 \)

What is the 11th term of the sequence in part c)?

(BB: \( a_{11} = 520 + 10 \times 120 = 520 + 1200 = 1720 \))

---

### Notes

**Whole class activity**

In order round class for terms up to 2000 (volunteers for terms over 2000 or under 0)

Agreement, praising

Discussion on the rule.

T might need to give a hint for b).

Let’s call the first term \( a_1 \), the 2nd term \( a_2 \), the 3rd term \( a_3 \), etc.

Discussion on general method for finding any term.

Extra praise if Ps make any positive contribution – but have no expectations!

**BB:**

\[
\begin{array}{c}
7 \\
50 \\
25 \\
12 \\
6 \\
3 \\
\end{array}
\]

Check:

\[
\begin{array}{c}
12 \div 3 = 4 \\
19 \div 3 = 6 \\
10 \div 3 = 3 \\
9 \div 3 = 3 \\
\end{array}
\]

---

**Individual work, monitored, helped**

(Or whole class activity for those T thinks are difficult)

Keep to strict time limit, especially for d), where only 2 terms are expected.

Reasoning, agreement, self-correction, praising

Details of calculations written on BB if problems, e.g.

d) \[
\begin{array}{c}
22 \times 24 = 528 \\
40 \times 9 = 360 \\
\end{array}
\]

T starts to write multiplications in the conventional way.

Extra praise for 7th term!

Whole class activity or individual or paired work
**Activity 8**

*PbY4a, page 26*

Q.4 Read: *Compare the quantities. Write in the missing signs.*

Elicit that it might be easier to compare if both sides were the same unit. Set a time limit.

Review at BB with whole class. Ps come to BB or dictate to T, explaining reasoning. Class agree/disagree. Mistakes discussed and corrected.

How much more is the greater quantity? Ps dictate to T or come to BB.

**Solution:**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a) $18 \text{ m } 32 \text{ cm} &lt; 19 \text{ m}$</td>
<td>b) $1 \text{ litre } 320 \text{ ml} &lt; 1720 \text{ ml}$</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>c) $4 \text{ kg } 460 \text{ g} &gt; 894 \text{ g}$</td>
<td>d) $1 \text{ m } 8 \text{ cm } 1 \text{ mm} &lt; 176 \text{ cm}$</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>e) $48 \text{ days} &gt; 5 \text{ weeks } 3 \text{ days}$</td>
<td>f) $420 \text{ minutes} &lt; 7 \text{ hrs } 31 \text{ min}$</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Notes

Individual work, monitored, helped

Written on BB or SB or OHT

Reasoning, agreement, self-correcting, praising

Whole class activity

Reasoning, agreement, praising

Details of calculations shown on BB if necessary, e.g.

c) 

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$4 \mid 4 \mid 6 \mid 0$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$8 \mid 9 \mid 4$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$3 \mid 5 \mid 6 \mid 6$</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

**Lesson Plan**

**Week 6**

### Activity 1

#### Mental calculation

If you were doing these calculations in your head, how would you do them? Ps come to BB or explain to T who writes on BB. Who agrees? Who would do it another way? Which is easier?

If you could write it down, how would you do the calculation? Ps come to BB or dictate to T. Do you think it is quicker to write it down or do it mentally?

**BB: e.g.**

- a) $48 + 37 = (85)$
- b) $64 - 26 = (38)$
- c) $49 \times 3 = (147)$
- d) $87 \div 4 = (21, \ r 3)$

<table>
<thead>
<tr>
<th>Example</th>
<th>Alternative Method</th>
<th>Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>$48 + 37$</td>
<td>$(48 + 30 + 7)$</td>
<td>$348 + 37 = (385)$</td>
</tr>
<tr>
<td>$64 - 26$</td>
<td>$(64 - 20 - 6)$</td>
<td>$764 - 26 = (738)$</td>
</tr>
<tr>
<td>$49 \times 3$</td>
<td>$(40 \times 3 + 9 \times 3)$</td>
<td>$249 \times 3 = (747)$</td>
</tr>
<tr>
<td>$87 \div 4$</td>
<td>$(80 \div 4 + 7 \div 4)$</td>
<td>$420 \div 6 + 12 \div 6$</td>
</tr>
</tbody>
</table>

**Notes**

Whole class activity

Operations written on BB or SB or OHT

Discussion, reasoning, agreement, checking, praising

**BB:**

<table>
<thead>
<tr>
<th>Calculation</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>$3 + 4 + 8$</td>
<td>$12$</td>
</tr>
<tr>
<td>$4 + 3 + 7$</td>
<td>$14$</td>
</tr>
<tr>
<td>$7 + 8 + 5$</td>
<td>$20$</td>
</tr>
<tr>
<td>$2 + 4 + 9$</td>
<td>$17$</td>
</tr>
<tr>
<td>$1 + 2 + 1$</td>
<td>$4$</td>
</tr>
</tbody>
</table>

Agree that in general written calculations are simpler.

---

### Activity 2

#### Sequences

In each sequence, the difference between any two adjacent numbers is the same. Let’s fill in the missing numbers.

Ps come to BB to write the numbers above the lines, explaining reasoning. Class checks that they are correct.

**BB:**

<table>
<thead>
<tr>
<th>Sequence</th>
<th>Rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) 300, 294, 288, 282, 276, 270, 264, 258, 252</td>
<td>$-6$</td>
</tr>
<tr>
<td>b) 590, 610, 630, 650, 670, 690, 710, 730, 750, 770</td>
<td>$+20$</td>
</tr>
<tr>
<td>c) 805, 822, 839, 856, 873, 890, 907, 924, 941, 958</td>
<td>$+17$</td>
</tr>
</tbody>
</table>

---

### Activity 3

#### PbY4a, page 27

**Q1** Read: Practise addition.

You may do the calculations mentally or write them in your Ex. Bks. Let’s see how many you can do in 3 minutes!

Start . . . now! . . . Stop!

Review with whole class. Ps change pencils and mark/correct their own work. Ps dictate answers, explaining reasoning.

Class points out errors.

Who had all 9 correct? Who made a mistake? What was your mistake? etc. Deal with all cases.

**Solution:**

<table>
<thead>
<tr>
<th>Example</th>
<th>Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) $56 + 18$</td>
<td>$74$</td>
</tr>
<tr>
<td>b) $43 + 29$</td>
<td>$72$</td>
</tr>
<tr>
<td>c) $37 + 48$</td>
<td>$85$</td>
</tr>
</tbody>
</table>

---

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Lesson Plan 27

<table>
<thead>
<tr>
<th>Activity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Y4</strong></td>
<td></td>
</tr>
<tr>
<td><strong>4</strong></td>
<td></td>
</tr>
<tr>
<td><strong>PbY4a, page 27</strong></td>
<td>Individual work, monitored (less able Ps helped and they might only be expected to do the first two columns)</td>
</tr>
<tr>
<td><strong>Q.2 Read:</strong> Practise subtraction.</td>
<td>Differentiation by time limit</td>
</tr>
<tr>
<td>You may do the calculations mentally or write them in your Ex. Bks. Let’s see how many you can do in 3 minutes! Start... now!... Stop!</td>
<td>Reasoning, agreement, self-correction, praising</td>
</tr>
<tr>
<td>Review with whole class. Ps change pencils and mark/correct their own or neighbour's work. Ps dictate answers, explaining reasoning. Class points out errors. Who had all 9 correct? Who made a mistake? What was your mistake? etc. Deal with all cases.</td>
<td>Feedback for T</td>
</tr>
<tr>
<td><strong>Solution:</strong></td>
<td>Class applauds Ps who had 18 correct in Q.1 and Q.2.</td>
</tr>
<tr>
<td>a) 92 – 16 = 76</td>
<td></td>
</tr>
<tr>
<td>392 – 16 = 376</td>
<td></td>
</tr>
<tr>
<td>492 – 216 = 276</td>
<td></td>
</tr>
<tr>
<td>b) 63 – 27 = 36</td>
<td></td>
</tr>
<tr>
<td>863 – 27 = 836</td>
<td></td>
</tr>
<tr>
<td>863 – 127 = 736</td>
<td></td>
</tr>
<tr>
<td>c) 56 – 49 = 7</td>
<td></td>
</tr>
<tr>
<td>556 – 49 = 507</td>
<td></td>
</tr>
<tr>
<td>556 – 449 = 107</td>
<td></td>
</tr>
<tr>
<td><strong>26 min</strong></td>
<td></td>
</tr>
</tbody>
</table>

| **5** |       |
| **PbY4a, page 27** | Individual work, monitored, helped (or whole class activity) |
| **Q.3 Read:** In each sequence the difference between any term and the next term is the same. Write the missing terms. | Written on BB or use enlarged copy master or OHP |
| Deal with one part at a time. Ps can do calculations in Ex Bks. Review at BB with whole class. Ps dictate terms to T and give the rule. Class agrees/disagrees. Mistakes discussed/corrected. | Discussion, reasoning, agreement, self-correction, praising |
| **Solution:** | Extra praise if Ps had e) correct! |
| a) 100, 940, 880, **820, 760, 700, 640, 580, 520** |       |
| Rule: – 60 |       |
| b) 100, 300, 500, **700, 900, 1100, 1300, 1500, 1700** |       |
| Rule: + 200 |       |
| c) 50, 220, 390, **560, 730, 900, 1070, 1240, 1410** |       |
| Rule: + 170 |       |
| d) 374, 360, 346, **332, 318, 304, 290, 276, 262** |       |
| Rule: – 14 |       |
| e) 263, 275, **287, 299, 311, 323, 335, 347, 359** |       |
| Rule: + 12 |       |
| **35 min** |       |

Discuss how to solve part e): |       |
BB: (311 – 287) ÷ 2 = 24 ÷ 2 = 12 |       |
Y4

Activity

6  PbY4a, page 21

Q.4  Read: Solve the problems in your exercise book.

Deal with one part at a time. Ps read the question themselves, make a plan, do the calculation and write the answer as a sentence in Ex. Bks.

Review with whole class. Ps come to BB to show their solution, explaining reasoning. Who agrees? Who thinks something else? Who did it a different way? Who made a mistake? What kind of mistake? etc.

Solutions:

a) 60 swallows are resting on the wire between two telegraph poles. What weight is on the wire if each swallow weighs about 30 grams?

BB: 1 swallow: 30 g 60 swallows: 30 g × 60

30 g × 60 = 300 g × 6 = 1800 g = 1 kg 800 g

Answer: There is about 1 kg 800 g on the wire.

b) Every time we breathe in, we take about half a litre of air into our lungs. We take a breath about 20 times every minute. How much air do we breathe in during 30 minutes?

BB: 1 breath: half a litre 1 minute: 20 × half a litre 30 minutes: 30 × 20 × half a litre = 30 × 10 litres = 300 litres

Answer: We breathe in about 300 litres of air in 30 minutes.

c) A hare weighs about 8 kg and a brown bear can weigh 40 times as much. What could be the weight of a brown bear?

BB: hare: 8 kg brown bear: 40 × 8 kg = 320 kg

Answer: A brown could weigh about 320 kg

7  PbY4a, page 27, Q.5

Read: Work out a rule and complete the table.

Agree on one form of the rule in words using the completed columns. Ps come to BB to choose a column and fill in the missing number, explaining reasoning. Class agrees/disagrees. Ps can think of several possible numbers for the last column.

Who can write the rule in a mathematical way? Who agrees? Who can write it another way? etc. Check with values from the table.

Solution

<table>
<thead>
<tr>
<th>a</th>
<th>b</th>
<th>c</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>80</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>7</td>
<td>242</td>
<td>65</td>
</tr>
</tbody>
</table>

Rule: \( c = 3 \times a + b \) \( b = c - 3 \times a \) \( a = (c - b) ÷ 3 \)

Who can think of other columns to add to the table?

Extension

Whole class activity (or individually if Ps wish)

Drawn on BB or use enlarged copy master or OHP

At a good pace

Discussion on the rule, reasoning, agreement, praising

Details of calculations shown on BB if problems.

Notes

Individual work, monitored, helped

Ps could show answers on scrap paper or slates in unison on command.

Reasoning, agreement, self-correcting, praising

Make sure that Ps realise the importance of writing 'about' or 'roughly' or '≈' in answers.

Feedback for T

Agreement, praising
### Activity

#### Products
Let’s choose from these digits $1$ $2$ $3$ $5$ and multiply a 3-digit number by a 1-digit number, so that the product is:

- a) the greatest possible, $BB$: $132 \times 5$
- b) the smallest possible,
- c) an even number, e.g. $311 \times 5$, $315 \times 2$, $153 \times 2$
- d) an odd number, e.g. $213 \times 5$, $251 \times 3$

#### Problem
Listen to the problem and picture it in your head. Write the data and do the calculation in your Ex. Bks. Show me the answer when I say.

*The human skull is made up of 29 bones, the spinal column has 26 bones, each arm has 32 bones, each leg has 31 bones and the remaining part of the body has 25 bones.*

*How many bones make up a human skeleton?*

Show me . . . now! (206)

P who responded correctly explains to those who did not. Mistakes discussed and corrected.

$$BB: \quad 29 + 26 + 32 + 31 + 31 + 25 \quad or \quad 2 \cdot 9 + 2 \cdot 6 + 3 \cdot 2 = 180 + 26 = 206 \text{ (bones)}$$

*Answer:* The human skeleton is made from 206 bones.

Would any of you like to be a doctor or nurse when you grow up? Why? Why not?

#### Find the mistakes
Pete is a year 4 pupil in another school. He is unsure of his units, so he has written several answers. Let's help him choose the correct one.

Ps come to BB to cross out unrealistic data and say why they cannot be correct. Class agrees/disagrees.

**BB:**

- a) Pete’s height is: $13 \text{ m}$, $13 \text{ mm}$, $13 \text{ cm}$, $130 \text{ cm}$
- b) Pete’s handspan is: $160 \text{ mm}$, $160 \text{ cm}$, $1600 \text{ cm}$
- c) Length of Pete’s step is: $46 \text{ m}$, $46 \text{ cm}$, $46 \text{ mm}$
- d) Pete’s age is: $103 \text{ years}$, $103 \text{ days}$, $103 \text{ weeks}$, $103 \text{ months}$

What other data could be written down? Ps suggest criteria and Ps estimate their own data. (e.g. weight, how far away from school they live, length of little finger, how high (long) they can jump, etc.)

### Notes

Whole class activity

Numbers written on BB or number cards stuck to BB

Ps come to BB to rearrange numbers and do calculations, explaining reasoning

Class checks that they are correct or suggests alternative multiplications.

At a good pace

Agreement, praising

Whole class activity

T repeats question slowly and Ps repeat in own words.

Responses written on scrap paper or slates and shown in unison.

Reasoning, agreement, self-correction, praising

Ps say answer as a sentence in unison.

Short discussion involving as many Ps as possible.

Whole class activity

Written on BB or use enlarged copy master or OHP

At a good pace

Reasoning, agreement, praising

In good humour!

Extra praise for creative suggestions.
**Lesson Plan 28**

### Activity

**PbY4a, page 28**

<table>
<thead>
<tr>
<th>Q.1</th>
<th>Read: <em>Solve the problems in your exercise book.</em></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deal with one part at a time. Ps read the question themselves, make a plan, do the calculation and write the answer as a sentence in <em>Ex. Bks</em>.</td>
</tr>
<tr>
<td></td>
<td>Review with whole class. Ps come to BB to show their solution, explaining reasoning. Who agrees? Who thinks something else? Who did it a different way? Who made a mistake? What kind of mistake? etc.</td>
</tr>
<tr>
<td><strong>Solutions:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>a)</strong></td>
<td><em>An athlete won a high jump competition with a jump of 236 cm. A dolphin can leap out of the water and into the air to a height which is 374 cm above that reached by the high jumper.</em></td>
</tr>
<tr>
<td></td>
<td><em>How high can this dolphin jump?</em></td>
</tr>
<tr>
<td></td>
<td>BB: A: 236 cm  D: 236 cm + 374 cm = 610 cm</td>
</tr>
<tr>
<td></td>
<td><em>Answer: This dolphin can jump to a height of 610 cm.</em></td>
</tr>
<tr>
<td><strong>b)</strong></td>
<td><em>A milk churn contained 7 litres 5 cl of milk. The farmer’s wife used 2 litres 18 cl of the milk to feed some newborn lambs. How much milk was left in the churn?</em></td>
</tr>
<tr>
<td></td>
<td>BB: Had: 7 litres 5 cl = 705 cl</td>
</tr>
<tr>
<td></td>
<td>Used: 2 litres 18 cl = 218 cl</td>
</tr>
<tr>
<td></td>
<td>Had left: 705 cl – 218 cl = 487 cl = 4 litres 87 cl</td>
</tr>
<tr>
<td></td>
<td><em>Answer: There was 4 litres 87 cl of milk left in the churn.</em></td>
</tr>
</tbody>
</table>

### Notes

- Individual work, monitored, helped
- (Ps could show answers on scrap paper or slates in unison on command.)
- Reasoning, agreement, self-correcting, praising

**Feedback for T**

Whole class activity

- Drawn on BB or use enlarged copy master or OHP
- Reasoning, agreement, praising

**Feedback for T**

Individual work, monitored, helped

- Drawn on BB or use enlarged copy master or OHP
- Discussion, reasoning, agreement, self-correction, praising
**Activity 7**

*PbY4a, page 28, Q.3*

Read: *Look at how the dividends, divisors and quotients change. Fill in the missing numbers and signs.*

Ps work out the divisions first in *Ex. Bks*. Ps come to BB to fill in missing quotients. Class agrees/disagrees. Then Ps fill in missing operations. Class checks mentally.

What do you notice? (e.g. If the dividend increases by a certain number of times, the quotient also increases by that number of times; if the divisor decreases by a certain number of times, the quotient increases by that number of times)

**Solution:**

- **a)**
  \[
  \begin{array}{c}
  108 \times 2 \\
  4 \quad 3 \quad 2 \\
  \times 2
  \end{array}
  \quad 216
  \]

- **b)**
  \[
  \begin{array}{c}
  152 \times 3 \\
  6 \quad 9 \quad 1 \quad 2 \\
  \div 3
  \end{array}
  \quad 456
  \]

---

**Notes**

Whole class activity
(or individual work if Ps wish)

Drawn on BB or use enlarged copy master or OHP

Reasoning, agreement, praising

T repeats what Ps have noticed more clearly if necessary.

---

**Activity 8**

*PbY4a, page 28*

Q.4 Read: *Solve the problems in your exercise book.*

Give Ps a set time to read questions themselves and do the calculations in *Ex. Bks*. Check that the amounts add up to 1200!

Review with whole class. T (or a P) reads each question and Ps show results on scrap paper or slates on command.

Ps who responded correctly explain to those who did not.

Mistakes discussed and corrected.

**Solutions:**

Flora has collected 1200 1p coins and she wants to put them in two piggy banks. How many coins should she put in each piggy bank so that there is:

- **a)** twice as much money in one piggy bank as in the other?
  
  BB: \(1200 \div 3 = 400\); (PB$_1$: 400 and PB$_2$: 800)

- **b)** half as much money in one piggy bank as in the other?
  
  BB: \(1200 \div 3 = 400\); (PB$_1$: 400 and PB$_2$: 800)

- **c)** three times as much money in one piggy bank as in the other?
  
  BB: \(1200 \div 4 = 300\); (PB$_1$: 300 and PB$_2$: 900)

- **d)** 1 third as much money in one piggy bank as in the other?
  
  BB: \(1200 \div 4 = 300\); (PB$_1$: 300 and PB$_2$: 900)

- **e)** five times as much money in one piggy bank as in the other?
  
  BB: \(1200 \div 6 = 200\); (PB$_1$: 200 and PB$_2$: 1000)

- **f)** 1 fifth as much money in one piggy bank as in the other?
  
  BB: \(1200 \div 6 = 200\); (PB$_1$: 200 and PB$_2$: 1000)

- **g)** 1 seventh as much money in one piggy bank as in the other?
  
  BB: \(1200 \div 8 = 150\); (PB$_1$: 150 and PB$_2$: 1050)

---

Individual work, monitored, to start, then whole class review
(or all done as a whole class activity, one at a time)

Piggy Banks drawn on BB
or use enlarged copy master

Discussion, reasoning, agreement, self-correction, praising

Extra praise if Ps realise that a) and b), c) and d), etc. are really the same question, e.g.

- twice as much in PB2 is the same as half as much in PB1
- 3 times as much in PB2 is the same as 1 third as much in PB1.

T could show solution like this:

Let \(s\) = smaller amount

- **a)**
  
  PB$_1$: \(s\), PB$_2$: \(2 \times s\)
  \[
  s + 2 \times s = 3 \times s = 1200
  \]
  \[
  s = 1200 \div 3 = 400
  \]
  
  So PB$_1$: 400 and
  PB$_2$: \(2 \times 400 = 800\)

- **c)**
  
  PB$_1$: \(s\), PB$_2$: \(3 \times s\)
  \[
  s + 3 \times s = 4 \times s = 1200
  \]
  \[
  s = 1200 \div 4 = 300
  \]
  
  So PB$_1$: 300 and
  PB$_2$: \(3 \times 300 = 900\)

etc.
<table>
<thead>
<tr>
<th>Activity</th>
<th>Notes</th>
</tr>
</thead>
</table>
| **1** Mental practice | Whole class activity
| a) T says an addition or subtraction. Ps say result. | T chooses Ps at random.
| b) T says a multiplication or division. Ps say result. | At speed
| c) P₁ says an operation, P₂ says result and then an operation for P₃, etc. | Class points out errors.
| **2** Competition | Whole class activity
| T divides class into 3 teams of roughly equal ability. T says a number, e.g. 320. I will give you 2 minutes to describe this number in as many different ways as you can. Start . . . now! . . . Stop! | Each team has a different SB or BB or flip chart to write on (hidden from other teams).
| Ps from other teams check each team's descriptions. Team with most correct is the winner (or in the case of equal amounts, class chooses the team with the most creative descriptions). | At speed
| e.g. 320: 300 + 20, 40 × 8, 960 ÷ 3, 500 – 180, etc. | Checking, evaluating
| | In good humour!
| | Class applauds the winners.
| **3** PbY4a, page 29 | Individual work, monitored, helped
| Q.1 Read: Are the statements true or false? Write T for True and F for False. | Responses shown on command in unison.
| Set a time limit. Ps read statements themselves and write T or F in Pbs. | Ps with incorrect responses try to give examples or counter examples.
| Review with whole class. P reads statement and class shows decisions by writing T or F on scrap paper or slates or by pre-agreed actions, (e.g. hold ears if True and clap hands if False). | Discussion, reasoning, agreement, self-correction, praising
| Solutions: a) Every number which is a whole hundred is divisible by 2. (T) | In d) elicit that:
| b) There is an even number which has 5 as its units digit. (F) | • numbers divisible by 5 must have 0 or 5 in units column;
| c) Every number which is divisible by 5 is a whole ten. (F) | • numbers divisible by 2 must be even.
| d) 217 is divisible by neither 5 nor 2. (T) | | | **4** PbY4a, page 29 | Individual work, monitored, helped and reviewed regularly or Whole class activity
| Q.2 Read: Write the answers in the number puzzle. | Drawn on BB or use enlarged copy master or OHP
| T makes sure that Ps understand what to do. T could do a horizontal and vertical clue with whole class first if necessary. | Ps agree on operation, then come to BB to fill in numbers, explaining reasoning. Class agrees/disagrees. Mistakes corrected.
| Review at intervals according to ability of class (e.g. every 5 or 10 minutes) Ps come to BB to fill in numbers, explaining reasoning. | Horizontal clues with whole class and Vertical clues individually, or vice versa or
| Ps agree on operation, then come to BB to fill in numbers or Some calculated in Ex. Bks, rest done with calculators or Ps use blank copy master and add own letters, numbers and clues | **Extension**
| Ps make up own clues for the numbers. | (In Ex. Bks or on grid sheet. Done for homework or in Lesson 30) | | **Lesson Plan**
| **29** | |
Completing or extending puzzle from Lesson 29

**PbY4a, page 30**

**Solutions:**

Q.1  

a) 800, 400, 200, (100, 50, 25, 12 1/2, 6 1/2, . . .) \[ ÷ 2 \]

b) 410, 520, 630, (740, 850, 960, 1070, 1180, . . .) \[ + 110 \]

c) 1, 4, 9, 16, (25, 36, 49, 64, 81, 100, 121, 144, . . .)  
[square numbers in increasing order: 1 × 1, 2 × 2, 3 × 3, etc. or difference increasing by 2]  

d) 800, 698, 596, (494, 392, 290, 188, 86, –16, . . .) \[ – 102 \]

e) 5, 15, 10, 25, (15, 35, 20, 45, 25, 55, 30, 65, . . .)  
[combination of two sequences:  
\[ a_1, a_3, a_5, a_7, . . . 5, 10, 15, . . . \]  
\[ a_2, a_4, a_6, a_8, . . . 15, 25, 35, . . . \]  
\[ + 5 \]  
\[ + 10 \]  

Q.2  

a) 1 m 6 cm < 182 cm  
76 cm  
5 min

b) 345 min > 5 hrs 40 min  
340 min  
1057 mm

c) 59 days = 8 weeks 3 days  
875 mm

d) 182 mm < 1 m 57 mm  
106 cm

Q.3  

<table>
<thead>
<tr>
<th></th>
<th>a</th>
<th>1</th>
<th>80</th>
<th>25</th>
<th>21</th>
<th>12</th>
<th>8</th>
<th>9</th>
<th>31</th>
<th>e.g.</th>
<th>e.g.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b</td>
<td>5</td>
<td>5</td>
<td>20</td>
<td>6</td>
<td>48</td>
<td>12</td>
<td>18</td>
<td>15</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>c</td>
<td>10</td>
<td>405</td>
<td>145</td>
<td>111</td>
<td>108</td>
<td>52</td>
<td>64</td>
<td>170</td>
<td>100</td>
<td>500</td>
</tr>
</tbody>
</table>

**Rule:** \( c = 5 \times a + b \),  
\( b = c – 5 \times a \),  
\( a = (c – b) ÷ 5 \)

Q.4  

- **Multiple of 5:** 30, 35, 40, 45, 50
- **Multiple of 6:** 30, 36, 42, 48

Q.5  

a)  

i) \[ 250 \text{ km} \times 4 = 800 \text{ km} + 200 \text{ km} = 1000 \text{ km} \]

ii) \[ 250 \text{ km} \times 2 + 250 \text{ km} ÷ 2 = 500 \text{ km} + 125 \text{ km} = 625 \text{ km} \]

b)  

12 seconds \( \rightarrow \) 100 m

i) \[ 6 \text{ seconds} \rightarrow 100 \text{ m} ÷ 2 = 50 \text{ m} \]

ii) \[ 60 \text{ seconds} \rightarrow 50 \text{ m} \times 10 = 500 \text{ m} \]  
(or 100 m × 5)