**Activity 1**

**Solids 1**

T has set of solids of various shapes on table at front of class, each labelled with a number.

![Shapes](image)

T elicits the difference between a solid shape (3-dimensional, has width, height and depth) and a plane shape (2-dimensional, has width and height but no depth, i.e. flat).

T holds up one of the shapes and describes it, saying how many faces (sides) it has, whether they are curved or plane, what shape the faces are (e.g. square, rectangle, triangle, circle), etc.

Which solids have:

a) only plane faces (1, 4, 5, 7, 8, 9)
b) only a curved surface (11, 12)
c) plane faces and curved faces (2, 3, 6, 10)
d) only faces which are rectangles (4, 5, 7, 8) (called cuboids)
   (T: All squares are rectangles, but not all rectangles are squares)
e) only faces which are squares? (8) (called a cube)

**Notes**

Whole class activity

(If possible, Ps should have set on desks too.)

BB: solid shape  plane shape

BB:  faces  curved or  plane

Whole class demonstration/discussion. Ps try to describe other shapes in a similar way, with T’s help.

Use enlarged copy master or OHP

Ps come out to point to shapes. Class agrees/disagrees.

T asks Ps which solids they know the names of.

BB:  cuboid  cube

**Activity 2**

**Solids 2**

a) Look at this cuboid (e.g. $4 \times 2 \times 3$).

- How many faces (sides) does it have? (6) Talk about plane shapes having sides (e.g. a triangle has 3 sides) and that the sides of solids are called faces (to avoid confusion).

  What shape are they? (rectangles) Are they all the same size? (No, there are 3 different sizes: $4 \times 2$, $4 \times 3$, $3 \times 2$; 2 faces for each size) Discuss 'opposite' and 'adjoining' faces.

- We call each corner a vertex. How many vertices does it have? (8)

- How many edges does it have? (12) Are they all the same length? (No, there are 3 different lengths, 4 edges for each length) Discuss 'opposite', 'equal', 'adjoining' edges (at a vertex).

b) Repeat with a different cuboid. (e.g. $3 \times 3 \times 5$)

- How many faces does it have? (6) Are they all the same size? (No, 2 different sizes: 4 equal rectangles and 2 equal squares)

  Revise similar shapes (i.e. the same shape but different sizes).

  The same shapes of equal size are congruent (equal).

- How many vertices (corners) does it have? (8)

- How many edges does it have? (12) Are they all the same length? (No, there are 2 different lengths, 8 are 3 units long and 4 are 5 units long).

b) Repeat for a cube (e.g. $3 \times 3 \times 3$)

Elicit that it has 6 faces, all congruent (equal) squares, 8 vertices and 12 edges, all of length 4 cm.

**Notes**

Whole class activity

T has demonstration model and/or Ps have cuboid on desks made from 24 unit cubes

a) BB:

![Faces: 6 rectangles
Vertice: 8
Edges: 12](image)

T explains each component. Ps count them. Discuss shapes, lengths, etc.

(Do not expect Ps to learn the geometric names yet, just to become familiar with them)

b) BB similar to part a), plus similar congruent agreement, praising

c) BB:

![Faces: 6 squares
Vertice: 8
Edges: 12](image)
**Activity 3**

**Cubes and cuboids**

a) Let’s look at this cuboid again. (T shows model of a $4 \times 2 \times 3$ cuboid to class.) How many unit cubes did we use to make it?

(24 unit cubes: 4 in a row, 3 rows: $3 \times 4 = 12$ on the bottom layer, 2 layers: $12 + 12 = 24$)

This is a drawing of the cuboid and these are the 6 faces (sides). Which face (side) belongs to which part of the cuboid?

Ps come out to point and to label, e.g. top, bottom, back, front, left, right (or T could have numbers on faces of real cuboid and Ps write appropriate numbers in each face). Who agrees? etc.

I wanted to make a model of this cuboid and cut out these patterns from card (use enlarged copy master). (T shows how the card can be folded along the dotted lines to make the different faces.) We call this a **net** for a solid.

Which of the two nets do you think will make this cuboid? Who thinks this one? Who thinks the other one? Why? Let’s check.

b) Repeat with a cube (e.g. $3 \times 3 \times 3$). Elicit it is made from 27 unit cubes: 3 in a row, 3 rows ($3 \times 3 = 9$) on the bottom layer, 3 layers: $9 + 9 + 9 = 3 \times 9 = 27$

Elicit that all 6 faces of a cube are equal (congruent), so any of the faces could be the front (back, top, bottom, left, right)

T has 3 different nets already prepared (from enlarged copy master). Which of these nets will make a cube?

Who thinks this one? Why? etc. Let’s check. (By folding)

T confirms that a cube is a cuboid with all its 6 faces equal (congruent). Elicit that all cubes are cuboids but not all cuboids are cubes.

---

**Activity 4**

**Names of components**

Let’s join up the name cards to the correct places on the diagrams.

BB: e.g.

Ps come out to choose a card, read it aloud and stick beside (or join to) an appropriate place. Who agrees? Where else could it go?

Who can show me where they are on these solids? Ps come out to point and count how many of each component each solid has.

Elicit:

- the names of the plane shapes (e.g. triangle, rectangle or square)
- that a **point** can be anywhere in/on the solid (inside, on the surface, on an edge, at a vertex).

---

**Notes**

**Whole class activity**

T has real model and if possible, Ps have models made from unit cubes on desks.

Drawn on BB or use copy master, enlarged, cut out and stuck to BB.

**BB:**

Nets for a cuboid

(By folding)

Agreement, praising

**Whole class activity**

Drawn on BB or use enlarged copy master or OHP (or copy master enlarged, cut out and items stuck to BB)

T should also have relevant solids to show to class.

At a good pace

Discussion, agreement, praising

Feedback for T
### Activity 5

PbY3a, page 51

**Q.1** Read: *Complete the table for these solids.*

Do one column on BB with whole class first if necessary. Review at BB with whole class. Check by counting relevant components on real solid. Mistakes corrected.

Extend the table to show how many faces of each solid are squares, rectangles which are not squares, triangles:

**Solution:**

<table>
<thead>
<tr>
<th>Solids</th>
<th>Number of faces</th>
<th>Number of vertices</th>
<th>Number of edges</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>5</td>
<td>8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Extension</th>
<th>Number of □</th>
<th>Number of □</th>
<th>Number of □</th>
</tr>
</thead>
<tbody>
<tr>
<td>rectangles which are not squares</td>
<td>6</td>
<td>–</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>–</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>–</td>
<td>–</td>
<td>2</td>
</tr>
</tbody>
</table>

**30 min**

---

### Lesson Plan 51

**Notes**

Individual work, monitored, helped

T should have models of the solids to show and if possible Ps should have small models on desks

Table drawn on BB or use enlarged copy master or OHP

Discussion, agreement, self-correction, praising

Whole class activity

T keeps extended part of table covered until required.

Ps come to BB to fill in rows. Class agrees/ disagrees. Check on real models.

Praising, encouragement only

---

### Activity 6

PbY3a, page 51

**Q.2** Read: *Which shape belongs in which box? Write the numbers in the correct boxes.*

Revise meaning of 'plane shapes' (2-D, flat, only width and height) and 'quadrilaterals' (plane shape with 4 straight sides) Review at BB with whole class. Mistakes corrected.

Who can tell me the names of any of the shapes? (e.g. 1) ball or sphere, 2) square, 3) rectangle, 4) cube, etc.).

**Solution:**

<table>
<thead>
<tr>
<th>Plane shapes</th>
<th>Rectangles</th>
<th>Solids</th>
<th>Quadrilaterals</th>
</tr>
</thead>
<tbody>
<tr>
<td>2, 3, 5, 7, 9, 10</td>
<td>2, 3</td>
<td>1, 4, 6, 8</td>
<td>2, 3, 9</td>
</tr>
</tbody>
</table>

**34 min**

---

### Activity 7

PbY3a, page 51

**Q.3** Read: *These plane shapes were cut out from coloured paper. List the numbers of the shapes which are:*

- a) *quadrilaterals*,
- b) *rectangles*,
- c) *squares*.

Review at BB with whole class. Mistakes corrected.

Discuss the case of shape 2). Some Ps might put it down as a quadrilateral. T confirms that it does have 4 sides, but quadrilaterals are bordered by 4 straight lines, and one of the lines in this shape is curved.

Elicit that all squares are rectangles and all rectangles are quadrilaterals (but not vice versa); rectangles are quadrilaterals with 'square' corners; squares are rectangles with all 4 sides equal.

**Solution:**

a) quadrilaterals: 1, 5, 6, 8, 11, 12
b) rectangles: 1, 8, 11
c) squares: 8, 11

**38 min**
**Activity 8**

**PbY3a, page 51**

Q.4  Read:  *How many different cuboids can you build from 12 unit cubes?*

   a) Fill in the table.

   b) Circle the cuboids which have at least one square face.

Ps have 4 plastic bags, each containing 12 unit cubes on desks. They make 4 different cuboids using 12 unit cubes for each one.

When they have made a shape, they count how many units long are the width (a), depth (b) and height (c) and write in the appropriate place in the table.

Review at BB with whole class. 4 Ps (or 3 if T has done one already) who have made different cuboids come out to BB to fill in table. Class agrees/disagrees by forming shape on desk.

Which of the cuboids have at least one square side? Ps come out to circle. Class agrees/disagrees. Mistakes corrected.

**Solution:** e.g.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edge a =</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Edge b =</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Edge c =</td>
<td>12</td>
<td>6</td>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>

Which cuboid has most squares on its surface? (surface area)

- **Cuboid 1:** 4 x 12 + 2 x 1 = 48 + 2 = 50 unit squares
- **Cuboid 2:** 2 x 12 + 6 x 2 x 2 = 24 + 12 + 4 = 40 unit sq.
- **Cuboid 3:** 2 x 12 + 4 x 3 = 24 + 8 + 6 = 38 unit sq.
- **Cuboid 4:** 4 x 6 + 2 x 4 = 24 + 8 = 32 unit squares

---

**Extension**

Individual (or paired work), monitored, helped

Table drawn on BB or use enlarged copy master or OHP

T explains task, or could build one cuboid and fill in a column of table with the whole class first if necessary to demonstrate.

Reasoning, agreement, self-correction, praising

Feedback for T

**Cuboids:** e.g.

1

2

3

4

Individual (or paired work)

Review findings with whole class

Calculations written on BB

Praising

---

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### Lesson Plan

#### Week 11

**Activity 1**

**Lines**

Study the diagram. What can you tell me about it? (e.g. shapes drawn on a square grid, 1st shape is a triangle, 2nd shape is a square (or 2 triangles), 3rd shape is a square plus a triangle (or 3 triangles), etc.

**BB:**

- These lines are **parallel** to each other. (T points) They stay the same distance away from each other, however long you make them. Who can show us other lines which are parallel? (in classroom or in diagram) Class agrees/disagrees.

- These lines are **perpendicular** to each other. (T points) They form a square corner called a **right angle**. Who can show us other lines which are perpendicular? (in classroom or in diagram) Class agrees/disagrees. (If there is disagreement, check angle with a square corner.)

- What is the rule for this sequence of shapes? (Each term has 1 more triangle than the previous term.) What will the next shape be? Ps come to BB to draw shapes, explaining reasoning. Class agrees/disagrees.

- How could we write this sequence as numbers? Ps suggest number sequences, explaining reasoning. Who agrees? Who thinks another one? etc.

**5 min**

---

**Activity 2**

**Shapes**

Study these shapes. **BB:**

T says the name of a shape. Ps come out to point to them.

Class agrees/disagrees or points out shapes missed.

- Which are solids? (1, 2, 5)
- Which are plane shapes? (3, 4, 6, 7, 8, 9, 10, 11, 12)
- Which are lines? (14, but also accept the sides of each plane shape)
- Which are points? (13, but also accept points on each shape)
- Which are rectangles? (3, 4, 10)
- Which are quadrilaterals but not rectangles? (12)
- Which have parallel lines? (3, 4, 5, 8, 10, 12, 14)
- Which have perpendicular lines (right angles)? (3, 4, 5, 8, 9, 10, 11)

**10 min**

---

**Activity 3**

**Parallel lines**

Ps each have two straws on desk. Arrange your straws so that they are:

- horizontal and parallel
- slanting and parallel
- one crossing over the other
- vertical and parallel
- not parallel

How can we be sure that lines are parallel? (Parallel lines will always stay the same distance apart, however far you extend them, so will never touch or cross over each other.)

**15 min**

---

**Notes**

Whole class activity

- Drawn on BB or use enlarged copy master or OHP
- **Bold** lines are already given

Discussion about diagram. Ps describe it. (Ps might remember the terms 'parallel' and 'perpendicular' from Y2)

**BB:**

- parallel lines
- perpendicular lines

Reasoning, agreement, praising

At a good pace

e.g. 1, 2, 3, 4, 5, . . . (triangles)
or 2, 4, 6, 8, . . . (grid squares)
Praising
**Perpendicular lines**

Which of these diagrams are similar and which are different?

**BB:**

- a), b) and e), the lines are perpendicular (form right angles)
- c), d), e) and f), the lines are \textit{not} perpendicular
- b) and d), the two lines cross each other
- a), c), e) and f), the ends of the lines touch

Lay your straws so that they are parallel (perpendicular, crossing, ends touching)

Everyone stand up! Hold one arm horizontal (vertical). Hold both arms parallel, (perpendicular, crossing each other, ends touching) . . . now! T walks round quickly, correcting and praising.

**20 min**

**Parallel and perpendicular lines**

Study the lines in this diagram. Which do you think are parallel and which are perpendicular? T shows the mathematical way to mark perpendicular lines (a square) and sets of parallel lines (arrowheads).

Ps come out to show and explain. Class agrees/disagrees.

**Solution:**

![Diagram of parallel and perpendicular lines]

Agreement, praising

Check perpendicular lines by using a square corner.

Check parallel lines by measuring perpendicular distance apart at both ends

**24 min**

**Folding**

Ps each have a piece of paper on desks. T demonstrates with large sheet of paper and Ps copy. Fold it once like this, and press down along the fold, then fold it again like this and press down the new fold. e.g.

![Diagram of folded paper]

Now open out the piece of paper. What do you notice? (The two crease lines are perpendicular.) Ps draw in the ‘perpendicular’ sign.

**26 min**
Lesson Plan 52

Y3

Activity

7

PbY3a, page 52

Q.1 Read: a) Draw over in the same colour the sets of lines which are parallel. Use different colours for different sets.

b) Colour a square at all the corners which are right angles.

T encourages Ps to work in a logical order (e.g. starting at 1st line on 1st letter and finding lines parallel to it). T shows Ps how to check whether lines are parallel (by counting grid squares up and across). Decide on a colour (e.g. red) for the right angles to make monitoring easier. Tell Ps to draw them smaller than a grid square.

Review at BB with whole class. Mistakes discussed.

How else could we have shown the sets of parallel lines? (arrows)

Solution: (arrows shown for T – too complicated for most Ps)

31 min

8

PbY3a, page 52

Q.2 Read: This is part of the track from a model railway. Measure the distance between the two horizontal rails.

A, come and show us on the picture where we should measure? Is A correct? Agree that measurement should be done on inside of rails.

T reminds Ps how to measure accurately with a ruler and to make sure that the ruler is perpendicular to the two lines.

Elicit the unit of measure being used and that mm are shown by the smallest 'ticks' on the ruler.

Ps measure and write length in mm in Pbs. Review at BB with whole class. Mistakes discussed and corrected.

Solution: 20 mm (= 2 cm)

Look at these drawings. Which of them could be railways? BB:

Ps come to BB to point and explain their reasoning. Class agrees/disagrees. (Only the two slanting tracks could be a railway; in the others the rails are not parallel, so the train would fall off!)

35 min

Notes

Individual work, monitored, helped

Use enlarged copy master or OHP

Discussion, reasoning, agreement, self-correction, praising

Note the case of RH slanting line in 'A' and lower slanting line in 'K'. (Not parallel: if shorter line is extended to 4 grid squares up, it has gone 4 grid squares across, compared with 3 grid squares across for the line in 'A')

Note right angles in K, M and Y.

Check right angles with a square corner (e.g. number card, or ruler)

Individual work, monitored (helped)

Ps have rulers on desks

Use enlarged copy master or OHP as demonstration only

T uses BB ruler

BB: 10 mm = 1 cm

Discussion, agreement, self-correction, praising

(Answer could be shown in unison on scrap paper)

Whole class activity

Drawn on BB or use enlarged copy master or OHP

Discussion involving several Ps, agreement, praising
### Lesson Plan 52

<table>
<thead>
<tr>
<th>Activity</th>
<th>Notes</th>
</tr>
</thead>
</table>
| Q.3 | **PbY3a, page 52**<br>Read: *Draw over in the same colour the sets of lines which are parallel. Use a different colour for each set.*<br>*Colour the squares at corners which are right angles.*<br><br>T again advises Ps to work logically as before and to colour small squares to show the right angles.<br><br>Review at BB with whole class. T asks Ps how many different sets of parallel lines they found in each diagram (i.e. how many different colours they used) and also how many right angles they drew. Ps who are correct come out to show their solutions.<br><br>Ps colour any parallel lines and right angles that they missed.<br><br>**Solution:** (arrows given for T only)

```
40 min
```

| Q.4 | **PbY3a, page 52**<br>Read: *Complete the drawing to make rectangles.*<br>What can you tell me about a rectangle? (4 sides, 4 square corners or right angles, opposite sides equal and parallel.)<br><br>Some parts of these rectangles have been rubbed out by mistake. Let’s see if you can draw them in.<br><br>Review at BB with whole class. Mistakes corrected<br><br>Note that part d) is a square but accept a rectangle if Ps extend sides beyond grid lines.<br><br>**Solution:**

```
45 min
```

Which rectangles are congruent? (b) and c)
Y3

<table>
<thead>
<tr>
<th>Activity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mental practice</td>
<td><strong>Lesson Plan</strong></td>
</tr>
</tbody>
</table>
| T says an operation (+, −, ×, ÷), Ps say only result.  
  e.g. 4 × 7, 150 − 50, 80 + 72, 250 ÷ 10, 30 × 4, 1 tenth of 60,  
  triple 15, 1 fifth of 25, twice 80, etc.  
  T says first few terms in a sequence and Ps continue it.  
  e.g. 6, 12, 18, . . .; 80, 60, 40, . . .; etc. (Ask for the rule too.)  
  **6 min** |
| Sequences  
  T writes first 3 terms of a sequence on BB. Ps decide on the rule and dictate the following terms.  
  a) 6, 12, 24, . . . (48, 96, 192, 384, 768, . . .)  
  (Rule: each following term is twice the previous term)  
  b) 2, 6, 18, . . . (54, 162, 486, . . .)  
  (Rule: each following term is 3 times the previous term)  
  c) 160, 80, 40, . . . (20, 10, 5, 2 and a half, . . .)  
  (Rule: each following term is half of the previous term)  
  **10 min** |
| Parts of a whole 1  
  Each P has 12 counters on desk (or beads, sticks, cubes, etc.) Let’s pretend they are sweets!  
  a) Your friend comes to see you, so you share the sweets equally between you. (Ps put counters into 2 equal groups)  
  ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○  
  How many equal parts did you make? (2 equal parts)  
  What part of the 12 sweets is yours (your friend’s)? (half, half)  
  How many of the 12 sweets are yours (your friend’s)? (6, 6)  
  Let’s complete this sentence. (T writes on BB, Ps complete in Ex. Bks.)  
  BB: 1 whole = \( \frac{1}{2} \) + \( \frac{1}{2} \) = 2 halves  
  Ps put counters back into one whole group.  
  b) This time, two friends come to see you, so you share the sweets equally among the three of you. (Ps put counters into 3 equal groups)  
  ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○  
  How many equal parts did you make? (3 equal parts)  
  What part of the 12 sweets is yours (each of your friend’s)? (1 third)  
  How many of the 12 sweets are yours (each of your friend’s)? (4)  
  Let’s complete this sentence. (T writes on BB Ps complete in Ex. Bks.)  
  BB: 1 whole = \( \frac{1}{3} \) + \( \frac{1}{3} \) + \( \frac{1}{3} \) = 3 thirds  
  c) Repeat for 3 friends (quarters) and 5 friends (sixths).  
  Let’s write the parts in increasing order. Discuss which is the smallest (biggest) part. (1 sixth, 1 half)  
  BB: 1 sixth < 1 quarter < 1 third < 1 half  
  \( (2) \ < (3) \ < (4) \ < (6) \)  
  **18 min** |

R: Mental calculation  
C: Fraction: halves, quarters, thirds  
E: Models  

Whole class activity  
At speed round class  
If P makes a mistake, next P corrects it.  
Agreement, praising  
Feedback for T

Whole class activity  
Discussion on the rule.  
Involve several Ps  
Ps dictate terms and T writes on BB.  
Agreement, praising  
Feedback for T

Whole class activity but individual manipulation, monitored, (helped)  
Either by putting 1 in 1 group, then 1 in the other, etc. or by dividing 12 by 2  
Discussion, agreement, praising  
Individual work, monitored, reviewed, corrected  
Make sure Ps know that the ‘whole’ in this case is 12.

Whole class activity  
Discussion, agreement, praising  
Individual work, monitored, reviewed, corrected  
Discussion, agreement, praising  
Check with the amounts  
Ps copy into Ex. Bks.
Parts of a whole 2
Let’s help Freddie Mouse. On Sunday, he was given this box of cheese. BB: Sunday
How many pieces of cheese are in the box? (6)

• On Monday, he ate 1 third of the cheese. How many pieces did he eat? (2 pieces) How many pieces did he have left? (4 pieces)

• On Tuesday, he ate 2 more pieces of cheese. What part of Monday’s amount of cheese did he have left? (half) What part of the original box of cheese did he have left? (1 third)

• On Wednesday, he ate 1 more piece of cheese. Did Freddie have any cheese left? (Yes, 1 piece) What part of the original box of cheese was this? (1 sixth)

PbY3a, page 53
Q.1 Read: Piggy bought different kinds of cakes for a party he was arranging. T explains that shaded parts of cakes are the amounts Piggy ate. Read: a) Piggy wanted to taste each cake right away. What part of these cakes did Piggy eat before the party?

b) After the party, Piggy checked on what had been left. Colour the parts of the cakes he found. Review at BB with whole class. Mistakes corrected.
Solution:

Q.2 Read: Colour one half of each shape in red and the other half in blue. Discuss the difference between plane shapes (which have adjoining sides) and line shapes (not joined up). Elicit that shapes first have to be divided into two equal parts. Review at BB with whole class. Deal with all solutions
Solution:

Where can you see halves in the classroom? Ps suggest some.
<table>
<thead>
<tr>
<th>Activity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson Plan 53</td>
<td>Individual work, monitored, helped</td>
</tr>
<tr>
<td>Q.3 Read: Each drawing is only half of the picture. Complete the whole drawing.</td>
<td>Drawn on BB or use enlarged copy master or OHP</td>
</tr>
<tr>
<td>Compare with previous question where the whole drawing was given and Ps coloured a half, whereas these drawings are half and Ps have to draw the whole.</td>
<td>T could have the shapes cut from card for Ps to manipulate on BB.</td>
</tr>
<tr>
<td>Review at BB with whole class. Deal with all solutions. Low ability Ps might need to have enlarged copy master.</td>
<td>Discussion, agreement, self-correction, praising</td>
</tr>
<tr>
<td>Solution: e.g.</td>
<td>Praise creative solutions</td>
</tr>
<tr>
<td>a) [Diagram A] b) [Diagram B] c) [Diagram C] d) [Diagram D] e) [Diagram E]</td>
<td>Which are symmetrical? (Ps show and explain)</td>
</tr>
<tr>
<td>Extension</td>
<td>Talk about symmetry, mirror images and mirror lines (Ps might remember from Y2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Extension</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual work, monitored, helped</td>
<td></td>
</tr>
<tr>
<td>Drawn on BB or use enlarged copy master or OHP</td>
<td></td>
</tr>
<tr>
<td>T could have the shapes cut from card for Ps to manipulate on BB.</td>
<td></td>
</tr>
<tr>
<td>Discussion, agreement, self-correction, praising</td>
<td></td>
</tr>
<tr>
<td>Praise creative solutions</td>
<td></td>
</tr>
</tbody>
</table>

---

### Lesson Plan 53

**Activity 7**

PbY3a, page 53

**Q.3** Read: Each drawing is only half of the picture.

Complete the whole drawing.

Compare with previous question where the whole drawing was given and Ps coloured a half, whereas these drawings are half and Ps have to draw the whole.

Review at BB with whole class. Deal with all solutions. Low ability Ps might need to have enlarged copy master.

**Solution:** e.g.

<table>
<thead>
<tr>
<th>Diagram A</th>
<th>Diagram B</th>
<th>Diagram C</th>
<th>Diagram D</th>
<th>Diagram E</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Diagram A" /></td>
<td><img src="image2" alt="Diagram B" /></td>
<td><img src="image3" alt="Diagram C" /></td>
<td><img src="image4" alt="Diagram D" /></td>
<td><img src="image5" alt="Diagram E" /></td>
</tr>
</tbody>
</table>

**Extension**

PbY3a, page 53, Q.4

Listen carefully, picture the story in your head and do the calculation in your Pbs. Draw a diagram if it will help you. Show me the answer on scrap paper when I say.

a) Read: Tom had a length of wire which was 110 cm long. He used half of it to make a model. What length of wire did he have left?

Show me your answer . . . now! (55 cm)

X, come and explain to us how you worked out your answer. Who agrees? Who did it another way?

**Plan:** Whole length: 110 cm Half the length: 110 cm ÷ 2

**Calculation:**

\[ 110 \text{ cm} \div 2 = 100 \text{ cm} + 10 \text{ cm} \div 2 \]

\[ = 50 \text{ cm} + 5 \text{ cm} = 55 \text{ cm} \]

**Check:** 55 cm + 55 cm = 110 cm

**Answer:** Tom had 55 cm of wire left.

b) Read: Last month Lucy had £30 in her savings bank. Today, this amount is only half of what she has saved. How much money does Lucy have now?

Show me your answer . . . now! (£60)

Y, come and explain to us how you worked out your answer. Who agrees? Who did it another way?

**Plan:** Half the amount: £30 Whole amount: £30 × 2

**Calculation:** £30 × 2 = £60

**Check:** £30 + £30 = £60

**Answer:** Lucy has £60 now.

---

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Money model
How much money can you see on the BB? Which amount is more? How much more?
Ps come to BB to write total value below each amount, write the inequality and then do the calculation. Agree that calculation can be done by subtracting the 100s first, then the tens, then the units.

a) BB:

\[
\begin{align*}
3 \times £50 + £2 &= £152 \\
5 \times £20 + 3 \times £5 &= £100 + £15 = £115 \\
£152 &> £115 \\
£152 - £115 &= £52 - £15 = £37
\end{align*}
\]

b) BB:

\[
\begin{align*}
£50 + 3 \times £20 + £1 &= £50 + £60 + £1 = £111 \\
2 \times £50 + 4 \times £2 + £1 &= £100 + £8 + £1 = £109 \\
£111 &> £109 \\
£111 - £109 &= £11 - £9 = £2
\end{align*}
\]

Numbers
Which 2-digit numbers have:

| a) the same number of tens as units  | (11, 22, 33, 44, 55, 66, 77, 88, 99) |
| b) more tens than units             | (10, 21, 31, 41, 54, 63, etc.) |
| c) more units than tens             | (12, 23, 36, 48, etc.) |
| d) 2 more tens than units           | (20, 31, 42, 53, 64, 75, 86, 97) |
| e) 2 more units than tens?          | (13, 24, 35, 46, 57, 68, 79) |

Addition
Let's practise addition. (T has SB or BB or OHP already prepared.)

BB:

| a) |= (9) | 20 + 70 = (90) | 120 + 70 = (190) | 2 + 70 = (72) |
| b) |= (13) | 5 + 80 = (85) | 50 + 80 = (130) | 50 + 180 = (230) |
| c) |= (18) | 3 + 90 + 60 = (180) | 30 + 90 + 6 = (126) |

Discuss relationships, e.g. 

\[
\begin{align*}
10 \times 2 + 10 \times 7 &= 10 \times 9; \\
100 + 20 + 70 &= 100 + 90 = 190; \\
50 + 180 &= 5 \text{ tens} + 18 \text{ tens} = 23 \text{ tens} = 230, \text{ etc.}
\end{align*}
\]

Whole class activity
Ds dictate answers, T writes on BB (or Ps list in Ex. Bks.)
Encourage Ps to think logically
Agreement, praising
## Activity

### Subtraction

Let's practise subtraction. (T has SB or BB or OHP already prepared.)

BB:

- a) \(8 - 5 = (3)\)  \(80 - 50 = (30)\)  \(80 - 5 = (75)\)
- b) \(18 - 5 = (13)\)  \(180 - 50 = (130)\)  \(180 - 5 = (175)\)
- c) \(13 - 7 = (6)\)  \(130 - 70 = (60)\)  \(130 - 7 = (123)\)
- d) \(18 - 9 - 7 = (2)\)  \(180 - 90 - 70 = (20)\)  \(180 - 9 - 7 = (164)\)

Discuss relationships and methods of calculation, e.g.

\[
180 - 50 = 10 \times 18 - 10 \times 5 = 10 \times 13 = 130; \\
130 - 70 = 100 + 30 - 70 = 100 - 70 + 30 = 30 + 30 = 60; \\
18 \text{ tens} - 9 \text{ tens} - 7 \text{ tens} = 9 \text{ tens} - 7 \text{ tens} = 2 \text{ tens} = 20 \\
180 - 9 - 7 = 180 - (9 + 7) = 180 - 16 = 164
\]

### Multiplication and division

Let's practise multiplication and division. Deal with one part at a time.

Review with whole class. Ps change pencils and mark/correct their own work. Ps dictate their answers, class agrees/disagrees. T writes on BB (or uncovers previously prepared answers).

BB:

- a) \(3 \times 8 = (24)\)  \(5 \times 4 = (20)\)  \(9 \times 3 = (27)\)
- \(10 \times 2 = (20)\)  \(6 \times 8 = (48)\)  \(18 \div 6 = (3)\)
- \(18 \div 9 = (2)\)  \(14 \div 2 = (7)\)  \(30 \div 3 = (10)\)
- \(54 \div 9 = (6)\)  \(9 \div 9 = (1)\)  \(0 \div 6 = (0)\)
- \(42 \div 6 = (7)\)  \(30 \div 6 = (5)\)  \(56 \div 7 = (8)\)

- b) \(32 \times 2 = (64)\)  \(120 \div 60 = (2)\)  \(45 \times 3 = (135)\)
- \(84 \div 4 = (21)\)  \(75 \div 5 = (15)\)  \(137 \times 1 = (137)\)
- \(89 \div 0 = (0)\)  \(121 \div 11 = (11)\)  \(0 \div 179 = (0)\)

Who had all 24 correct? Who had 1 mistake (2, 3, 4, 5, more than 5 mistakes)? What were your mistakes? How did you do the calculation?

e.g. \(45 \times 3 = 40 \times 3 + 5 \times 3 = 120 + 15 = 135\)

\(84 \div 4 = 80 \div 4 + 4 \div 4 = 20 + 1 = 21\)

\(75 \div 5 = 50 \div 5 + 25 \div 5 = 10 + 5 = 15\)

\(121 \div 11 = 110 \div 11 + 11 \div 11 = 10 + 1 = 11\)

### PbY3a, page 54

Q.1 Read: _Colour a quarter of each shape._

Elicit that most of the shapes have been divided into 4 equal parts, and each part is 1 quarter. Ps divide up the circle themselves.

Review at BB with whole class. Show different solutions and discuss mistakes. What part of each shape has not been coloured? (3 quarters)

Let's colour another quarter of the shapes in a different colour. How much of each shape have we coloured now? (2 quarters = 1 half) If we coloured 3 quarters what would be left uncoloured? (1 quarter). How many quarters make 1 whole circle (shape, unit)? (4)

---

**Notes**

Whole class activity

Ps come out to BB to write in answers, explaining reasoning

Class points out errors

(Or Ps copy into _Ex. Bks._, writing in the answers too)

Discussion, agreement, praising

(T gives hints if Ps cannot suggest any)

---

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Lesson Plan 54

**Activity 7**  
*PbY3a, page 54*

**Q.2** Read:  *Colour one third of each shape in red and another third in green.*

Elicit that 1 third means that the shape should be divided into 3 equal parts, and each part is 1 third.

Review at BB with whole class. Show different solutions and discuss mistakes. What part of each shape has been coloured (not been coloured)? (2 thirds, 1 third)

BB:  
1 third + 1 third + 1 third = 3 thirds = 1 (unit)  
(red) (green) (white)

Discuss the cases of the last 3 rectangles:

What is 1 third of 6 (24) squares? (2 squares, 8 squares)

How could we write it as an operation? Ps come out to write, class agrees/disagrees.

What part of each of these 3 rectangles would 1 square be?  
(T points to each in turn) (1 sixth, 1 sixth, 1 twenty-fourth)

---

**Extension**

**Q.2** Read:  *Coloured one third of each shape in red and another third in green.*

Elicit that 1 third means that the shape should be divided into 3 equal parts, and each part is 1 third.

Review at BB with whole class. Show different solutions and discuss mistakes. What part of each shape has been coloured (not been coloured)? (2 thirds, 1 third)

BB:  
1 third + 1 third + 1 third = 3 thirds = 1 (unit)  
(red) (green) (white)

Discuss the cases of the last 3 rectangles:

What is 1 third of 6 (24) squares? (2 squares, 8 squares)

How could we write it as an operation? Ps come out to write, class agrees/disagrees.

What part of each of these 3 rectangles would 1 square be?  
(T points to each in turn) (1 sixth, 1 sixth, 1 twenty-fourth)

---

**Q.3** Read:  
*a) Each drawing is 1 third of a unit. Complete it to make the whole unit.*

*b) Each drawing is 1 quarter of a shape. Complete it to make the whole shape.*

Compare with previous question where the whole was given and Ps coloured part, whereas these drawings are 1 part and Ps have to draw the whole.

Deal with one part at a time. Review at BB with whole class. Discuss different solutions.

**Solution:** e.g.

*a)  
[Diagram of three parts divided into thirds]  
[Diagram of a whole shape divided into quarters]*

*b)  
[Diagram of three parts divided into thirds]  
[Diagram of a whole shape divided into quarters]*

---

**Q.4** Read:  *Join up the labels to the corresponding shapes.*

Ps come out to BB to choose a shape and join it to matching fraction, explaining reasoning. Class agrees/disagrees.

BB:  
What fraction of each rectangle is 1 square? (T points to each.)

How many halves (thirds, quarters, sixths, eighths, etc.) are there in 1 unit?

Which is bigger, 1 quarter or 1 third (1 sixth or 1 eighth)?

---

**Notes**

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

Whole class discussion  
Ps come to BB to point  
Feedback for T  
BB: 1 third of 6 = 6 ÷ 3 = 2  
1 third of 24 = 24 ÷ 3 = 8

Extra praise if Ps deduce this without help

---

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

Whole class discussion

Show that:

3 thirds = 2 thirds + 1 third = 1 unit

4 quarters = 1 half + 1 half = 1 quarter + 3 quarters = 1 unit

**Check:**

*a) 1 third of 9 = 9 ÷ 3 = 3  
*b) 1 quarter of 12 = 12 ÷ 4 = 3***

---

**Whole class activity**  
Drawn on BB or use enlarged copy master or OHP (or items cut out and stuck to BB)  
At a good pace  
Reasoning, agreement, praising

Elicit that:

1 half = 2 quarters = 3 sixths  
= 4 eighths = . . .

Feedback for T. Praising only
<table>
<thead>
<tr>
<th>Activity</th>
<th>Notes</th>
</tr>
</thead>
</table>
| Tables practice, written exercises, revision, activities, consolidation *PbY3a, page 55*  
Q.5 Whole class activity using a model clock (as introduction to time in *Lesson 56*) |
R: Mental calculation
C: Time: quarter, half, three quarters of an hour; 15, 30, 45 minutes
E: Sequences of congruent numbers

Lesson Plan

56

Notes
Whole class activity
T has BB or SB or OHP already prepared
Ps come out to BB to write in answers, explaining reasoning
Class points out errors
At a good pace
Discussion, agreement, praising
Consolidate methods of finding the unknown number

Activity

1

Missing numbers
Which numbers are missing from these equations?
BB:

a) \(16 + 4 = \[\quad\] 160 + \[\quad\] = 200 \quad \[\quad\] + 140 = 200\)
\(15 + 3 = \[\quad\] 150 + \[\quad\] = 180 \quad \[\quad\] + 130 = 180\)
b) \(20 – 5 = \[\quad\] 200 – \[\quad\] = 150 \quad \[\quad\] - 150 = 50\)
\(17 – 4 = \[\quad\] 170 – \[\quad\] = 130 \quad \[\quad\] - 140 = 30\)
Discuss methods of calculation and relationships/connections.
e.g. \(160 + \[\quad\] = 200: \quad 200 - 160 = 40, \quad 160 + 40 = 200\)
\(170 - \[\quad\] = 130: \quad 170 - 130 = 40, \quad 170 - 40 = 130\)
\(\[\quad\] - 140 = 30: \quad 140 + 30 = 170, \quad 170 - 140 = 30\)

2

Written exercises
T dictates an operation, Ps write in Ex. Bks and calculate the result..
a) \(3 \times 6 = (18) \quad 30 \times 6 = (180) \quad 3 \times 60 = (180)\)
b) \(24 \div 8 = (3) \quad 240 \div 8 = (30) \quad 240 \div 80 = (3)\)
c) \(7 \times 3 + 140 = (161) \quad 96 + 60 \div 3 = (116) \quad 132 - 120 \div 6 = (112)\)
d) \(126 - 5 \times 6 = (96) \quad 90 \div 3 + 75 = (105) \quad 200 \div 5 - 26 = (14)\)
Review orally round class. Write details of difficult calculations on BB.

3

Graph of remainders
We are going to divide the whole numbers by 4 and show the remainders on this graph. T explains graph (with help of Ps).
(e.g. \(x\) axis is horizontal and shows the whole numbers, \(y\) axis is vertical and shows the remainders; \(x\) axis and \(y\) axis are perpendicular to each other). T starts, then Ps continue.
BB:

Let’s list the numbers which have remainder 3 (2, 0, 1).
Discuss the graph (e.g. pattern of slanting parallel lines of dots, why there are no dots on the horizontal grid line at 4 on \(y\) axis, etc.)

4

PbY3a, page 56
Q.1 Read: Colour the correct number of marbles. Write a division about each picture.

Review at BB with whole class. Discuss other fractions:
e.g. \(1\) half, \(2\) thirds, \(3\) quarters, \(5\) sixths, \(7\) eighths, \(1\) twelfth
### Lesson Plan 56

#### Activity

5. **Units of Time**

T says a statement, Ps decide on the most appropriate unit of measure.

- a) The duration of a holiday. (weeks or days)
- b) The time spent on a long train journey. (hours)
- c) The time taken to run a 400 m race. (minutes)
- d) The length of a school day. (hours)
- e) The length of a human life. (years)

What units of time have we not mentioned? (months, seconds)

---

6. **Model clock**

Look at this clock or at your watch. What does the little (big) hand show? (hours, minutes)

T sets clock to 12 o’clock. A, come and move the clock on 1 hour. Who can tell us how much time has passed using another unit? (60 min)

Let’s count the minutes in 5s. T points to numbers on clock, Ps recite: ‘5 minutes, 10 minutes, 15 minutes, . . ., 55 minutes, 60 minutes’

How many numbers did I point to? (12) Elicit that each number represents groups of 5 minutes.

T puts the clock back to 12 o’clock. B, come and move the clock on half an hour. How many minutes have passed? (30 minutes)

BB: half an hour = 60 minutes ÷ 2 = 30 minutes

Repeat for a quarter of an hour and 3 quarters of an hour.

BB: 1 quarter of an hour = 60 minutes ÷ 4 = 15 minutes

3 quarters of an hour = 1 quarter + 1 quarter + 1 quarter

= 15 minutes + 15 minutes + 15 minutes

= 45 minutes

---

7. **Setting the Time**

Ps have model clocks on desk. T has large real or model clock for demonstration. Everyone set your clocks to 12 o’clock. (T checks)

a) Move your clock on 1 hour and 20 minutes. Show me . . . now!

How can we write it? (e.g. 1 hour 20 minutes; 1 h 20 min; 1:20)

What time is it showing? (e.g. twenty past one) How else could we say it? (e.g. twenty minutes after 1 o’clock)

Discuss the positions of the hands on the clock. (The minute hand is pointing exactly to the 4 (20 minutes, i.e. a third of the way round the clock) but the hour hand is past the 1 and 1 third of the way between the 1 and 2. Elicit that the hour hand only points directly to a number on a whole hour.)

Repeat for other times. (e.g. 4 hours 50 minutes: ten to five, 4:50; 10 hours 45 minutes: a quarter to eleven, 10:45)

b) T sets the clock to different times. Ps read it.

P comes to the front, sets a time and chooses a P to read it.

P says a time, class sets their clocks and shows on command.

P at front points out errors (with T’s help).

---

**Notes**

Whole class activity

Ps can tell class about own holidays, train journeys, etc.

Elicit that:

BB: 1 year = 12 months

1 month ≈ 4 weeks

1 week = 7 days

1 day = 24 hours

1 hour = 60 minutes

(1 minute = 60 seconds)

Whole class activity

T has large real and model clocks.

BB: 1 hour = 60 minutes

In unison

Discussion, reasoning, agreement, praising

Ps suggest what activity might take 1 hour (half an hour, a quarter of an hour, etc.)

Whole class activity

Use copy master Y2 LP 103/1

In unison

Discussion on different ways to say and write the time

Involve several Ps

Demonstrate on large model or real clock

Discuss digital display if time (24 hour clock)

E.g. 01:20 or 13:20

am or pm

before 12 noon, or after 12 noon
**Lesson Plan 56**

**Notes**
- Individual work, monitored, helped
- Use enlarged copy master or OHP or show times on model clock
- Agreement, self-correction, praising

**Week 12**

**Activity**

**8**  
*PbY3a, page 56*

Q.2  Read: *How many hours and minutes do the hands on the clock show?*

Review at BB with whole class. Mistakes corrected. Discuss other ways to say and write the times.

*Solution:*

<table>
<thead>
<tr>
<th>Hours</th>
<th>Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>30</td>
</tr>
<tr>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td>12 or 0</td>
<td>45</td>
</tr>
<tr>
<td>3</td>
<td>55</td>
</tr>
</tbody>
</table>

Discuss positions of hour hands (e.g. LH clock: minute hand has gone half way round the clock, so hour hand is half way between 7 and 8) Are these times morning, afternoon or night? How would we say (write) these times? (e.g. LH clock: 'half past seven', 7:30 or 15:30, 7.30 am or 7.30 pm)

---

**9**  
*PbY3a, page 56*

Q.3  

a) Read: *How many minutes does the minute hand on the clock show when it is pointing to these numbers? Complete the table.*

Ps come out one after the other to choose a column, show it on the model clock and write in the minutes. Class points out errors. Ps complete table in *Pbs* too.

*Solution:*

<table>
<thead>
<tr>
<th>Minute hand points to:</th>
<th>12</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minutes shown</td>
<td>0</td>
<td>5</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td>25</td>
<td>30</td>
<td>35</td>
<td>40</td>
<td>45</td>
<td>50</td>
<td>55</td>
</tr>
</tbody>
</table>

b) Read: *Shade the clocks to show how far the minute hand has gone. Join up the clocks which are the same.*

Ps first draw a vertical line from the centre to the '12' on each clock, then they draw a line from the centre to the appropriate position and colour the relevant segment.


*Solution:*

| 5 minutes | 15 minutes | Half an hour | 3 quarters of an hour | 30 minutes | 45 minutes |

---

**Extension**

If the hour hand is at 12 noon, what times do these clocks show? (orally and written)
### Lesson Plan 56

**Y3**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>PbY3a, page 54, Q.4</td>
<td>Whole class activity</td>
</tr>
<tr>
<td>Read: <em>Compare the two sides. Write the correct sign between them.</em></td>
<td>Written on BB or use enlarged copy master or OHP</td>
</tr>
<tr>
<td>Ps come out to BB to write in the missing signs, explaining reasoning.</td>
<td>Ps write in <em>Pb</em> too</td>
</tr>
<tr>
<td>Class agrees/disagrees. If problems, demonstrate on model clock.</td>
<td>At a good pace</td>
</tr>
<tr>
<td>For inequalities, Ps also say how many minutes more or less.</td>
<td>Reasoning, agreement, praising</td>
</tr>
</tbody>
</table>

**Solution:**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>half an hour ≤ 35 min</td>
<td>b) 15 min ≥ quarter of an hour</td>
</tr>
<tr>
<td></td>
<td>(30 min)</td>
<td>(15 min)</td>
</tr>
<tr>
<td>c) 50 min ≥ 3 quarters of an hour</td>
<td>d) 1 hour ≤ 60 min</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(20 min)</td>
<td>(25 min)</td>
</tr>
<tr>
<td>e) a quarter of an hour + 5 min ≤ half an hour – 5 min</td>
<td>f) 20 min + half an hour ≥ a quarter of an hour + half an hour</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(50 min)</td>
<td>(45 min)</td>
</tr>
</tbody>
</table>

**Feedback for T**

(Or as individual work, monitored, helped, with time-limit differentiation)
### Activity 1
#### Number line

Let’s join the numbers to the corresponding points on the number line.

- **a)**
  - 4  15  20  30  33  38  41  49
  - 0  10  20  30  40  50  60

- **b)**
  - 74  85  96  100  103  108  111  119
  - 70  80  90  100  110  120  130

Ps come out to choose a number and join to number line. Elicit that the 'ticks' show the even numbers, so the odd numbers are half-way between the ticks.

5 min

### Activity 2
#### What is the rule?

Ps decide on one form of the rule using the completed columns.

(e.g. numbers in a are 50 more than in b)

Ps come out to choose a column and fill in a missing number, explaining reasoning. Class points out errors.

Who can write the rule in a mathematical way? Who agrees? Who can write it another way? etc.

**Solution:**

<table>
<thead>
<tr>
<th></th>
<th>106</th>
<th>132</th>
<th>200</th>
<th>113</th>
<th>158</th>
<th>121</th>
<th>185</th>
<th>197</th>
<th>146</th>
<th>93</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>56</td>
<td>82</td>
<td>150</td>
<td>63</td>
<td>108</td>
<td>71</td>
<td>135</td>
<td>147</td>
<td>96</td>
<td>43</td>
</tr>
</tbody>
</table>

5 min

### Activity 3
#### Written exercises

T dictates a calculation. Ps write in Ex. Bks and show result on command. Ps who respond incorrectly work through calculation on BB with help of class. Discuss the need for brackets in c) and d).

- **a)** The sum of 56 and half of 140. Show me . . . now! (126)
  - BB: 56 + 140 ÷ 2 = 56 + 70 = 126

- **b)** The difference between 140 and half of 56. Show . . . now! (112)
  - BB: 140 – 56 ÷ 2 = 140 – 28 = 140 – 20 – 8 = 120 – 8 = 112

- **c)** Half of the sum of 140 and 56. Show me . . . now! (98)
  - BB: (140 + 56) ÷ 2 = 196 ÷ 2 = 100 ÷ 2 + 80 ÷ 2 + 16 ÷ 2
  - = 50 + 40 + 8 = 98

- **d)** Half of the difference between 140 and 56. Show . . . now! (42)
  - BB: (140 – 56) ÷ 2 = (140 – 40 – 10 – 6) ÷ 2 = 84 ÷ 2 = 42

- **e)** The difference between 140 and 2 times 56. Show . . . now! (28)
  - BB: 140 – 2 × 56 = 140 – 2 × 50 – 2 × 6 = 140 – 100 – 12
  - = 40 – 12 = 28

10 min

---

**Lesson Plan 57**

**Notes**

Whole class activity

Drawn on BB or use enlarged copy master or OHP, or stick dots (red for even and green for odd) on class number line

At a good pace

Agreement, praising

Whole class activity

Drawn on BB or use enlarged copy master or OHP

Reasoning, agreement, praising

**Rule:**

\[
\begin{align*}
 a &= b + 50 \\
 b &= a - 50 \\
 a - b &= 50
\end{align*}
\]

Bold numbers given

Whole class activity

T repeats each part slowly

Ps nod heads when they have done calculation

Ps show answers on scrap paper (or with number cards) in unison

Discussion, agreement, self-correcting, praising

Ps explain easy ways to do the calculations

(Or done as mental practice if class is able)
### Lesson Plan 57

#### Activity

**4** Fractions of shapes

What part of each shape is shaded? Ps come to BB to choose a shape, say and write the fraction shaded and explain their reasoning. Class agrees/disagrees. Ask for equivalent fractions where relevant.

**BB:**

- 1 quarter
- 2 quarters
- 1 half
- 1 third
- 1 half
- 2 thirds
- 1 quarter
- 2 thirds

E.g. reasoning for RH shape: 'The whole rectangle is divided into three equal parts, so each part is 1 third. Two of the parts are shaded, so 2 thirds of the shape are shaded.'

How much of each shape is not shaded?

20 min

**5** Addition

*Sammy Snail* has written his homework on his shell. What do you think his teacher told him to do? Ask several Ps what they think. (He had to think of times which added up to 1 hour.)

Let's mark *Sammy Snail*'s work. If you think it is correct, hold your ears and if you think it is wrong, clap your hands when I say.

Class reads out each addition. Is it correct? Show me...now!

Let's check. Elicit that *Sammy Snail* got one wrong and forgot to finish the last one. Let's help him finish it.

**BB:**

Who can think of other additions *Sammy Snail* could have written?

25 min

**Extension**

Who can think of other additions *Sammy Snail* could have written?

- 30 min + half an hour
- 1 quarter of an hour + 45 min
- 2 x 20 min + a quarter of an hour + 5 min
- 3 quaters of an hour + 1 quarter of an hour
- half an hour + 20 minutes
- 10 min + a quarter of an hour
- half an hour + 5 minutes
- 30 min + 30 min = 60 min
- 15 min + 45 min = 60 min
- 40 min + 15 min + 5 min = 60 min
- 45 min + 15 min = 60 min
- 30 min + 20 min = 50 min < 60 min
- 10 min + 15 min + 30 min + 5 min = 60 min

Agreement, praising

**Extension**

Who can think of other additions *Sammy Snail* could have written?

- 1 quarter
- 2 quarters
- 1 half
- 1 third
- 1 half
- 2 eighths
- 1 quarter
- 2 thirds

**6** 

*PbY3a, page 57*

**Q.1 Read:**  *The clock is set at 12 noon. Draw where the hands of the clock will be after these amounts of time.*

If possible, Ps should each have model clocks on desks.

Ps set the time first and show to T on command, then draw hands on the clocks in *Pbs*. Discuss where the hour hand should be (e.g. RH clock: 20 minutes = 1 third of an hour, so hour hand will be 1 third of the way between the '12' and '1')

Elicit that 'h' means 'hours' and 'min' means 'minutes'.

Ps draw hands on clocks. Which times are the same?

**Solution:**

- 12 h 15 min
- 12 h 30 min
- Quarter of an hour
- 12 h 20 min

**Extension**

Individual work, but class kept together

Use copy master *Y2 LP 103/1*

T checks on model/real clock

BB: 60 min ÷ 3 = 20 min

Encourage Ps to use rulers to draw straight lines.

Discussion, agreement, praising

What would the times be using the 24 hour clock?

(00:15, 00:30: 12:15, 00:20)
### Activity

#### 7

**PbY3a, page 57**

**Q.2** Read: *Join up the equal amounts.*

Review at BB with whole class. Ps come out to join up values and explain reasoning (with T’s help). Write details of calculations on BB if necessary. Mistakes corrected.

BB: e.g. 1 third of an hour = 60 min ÷ 3 = 20 min

2 thirds of an hour = 60 min ÷ 3 × 2 = 40 min

1 quarter of an hour = 60 min ÷ 4 = 15 min

3 quarters of an hour = 60 min ÷ 4 × 3 = 45 min

**Solution:**

<table>
<thead>
<tr>
<th>1 third of an hour</th>
<th>2 thirds of an hour</th>
<th>3 quarters of an hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 minutes</td>
<td>40 minutes</td>
<td>45 minutes</td>
</tr>
</tbody>
</table>

**Extension**

**PbY3a, page 57**

**Q.3** Read: *Complete the open sentences so that they are correct.*

Review at BB with whole class. Check on model or real clock. If problems, write details of calculations on BB.

**Solution:**

a) 3 quarters of an hour + 1 quarter of an hour = 1 hour

b) 30 minutes + half an hour = 1 hour

c) 20 minutes + half an hour + 10 minutes = 1 hour

d) A quarter of an hour + a third of an hour + 25 minutes = 1 hour

Let’s think of other times which add up to 1 hour.

e.g. T: ‘1 third of an hour’, P₁: ‘plus 10 min’, P₂: ‘plus half an hour’, P₃: ‘equals 1 hour’; etc. Class points out errors.

**Solution:**

| 35 min |

### Notes

Individual work, monitored, helped

Written on BB or use enlarged copy master or OHP

Discussion, reasoning, agreement, self-correction, praising

Remind Ps of order of operations if only × and ÷ (work from left to right)

What other fractions of an hour can you think of?

(e.g. 1 sixth of an hour = 60 min ÷ 6 = 10 min)

Praising

---

#### 8

**PbY3a, page 57**

**Q.3** Read: *Complete the open sentences so that they are correct.*

Review at BB with whole class. Check on model or real clock. If problems, write details of calculations on BB.

**Solution:**

a) 3 quarters of an hour + 1 quarter of an hour = 1 hour

b) 30 minutes + half an hour = 1 hour

c) 20 minutes + half an hour + 10 minutes = 1 hour

d) A quarter of an hour + a third of an hour + 25 minutes = 1 hour

Let’s think of other times which add up to 1 hour.

e.g. T: ‘1 third of an hour’, P₁: ‘plus 10 min’, P₂: ‘plus half an hour’, P₃: ‘equals 1 hour’; etc. Class points out errors.

**Solution:**

| 40 min |

### Notes

Individual work, monitored, helped

T has BB or SB or OHP already prepared

Discussion at model clock, reasoning, agreement, self-correction, praising

BB: a) 45 + 15 = 60

b) 30 + 30 = 60

c) 20 + 30 + 10 = 60

d) 15 + 20 + 25 = 60

Orally, at speed round class

Praise creativity

---

#### 9

**PbY3a, page 57, Q.4**

Read: *If the statement is correct, write a tick in the box. If not, write a cross and correct the mistake*  

Ps read each part and write a tick or cross in their Pbs. If you marked it correct, put your hands on your heads and if you marked it wrong, stand up when I say.

Show me your answer . . . now! Ps who responded correctly explain to those who were wrong. Mistakes corrected.

**Solution:**

a) 1 hour = 60 minutes ✔

b) Half an hour = 20 minutes × (30)

c) Half an hour = 2 quarters of an hour ✔

| 120 minutes |

d) 20 minutes = 2 thirds of an hour × (1 third)

e) 3 quarters of an hour = 45 minutes ✔

| 120 minutes |
f) 2 thirds of an hour = 1 quarter of an hour + 15 minutes × (25)

g) 2 quarters of an hour = 1 quarter of an hour + 15 minutes ✔

| 45 min |

### Notes

Whole class activity, but individual work first in Pbs.

Or other suitable actions – Ps could choose

In unison

Reasoning, agreement, self-correction, praising

In good humour!

If time, Ps come to front to say own statements and class shows whether true or false on command from Ps.
**Activity**

1. **Fractions 1**
   *Barry Bear* has done his homework and wants us to check it for him. What do you think he had to do? How well has he done?

   **BB:**
   
   - a) 1 half ✗
   - b) 2 thirds ✓
   - c) 1 quarter ✗
   - d) 1 third ✓
   - e) 1 half ✗
   - f) 1 quarter ✓
   - g) 1 whole ✓

   **Reasoning:** e.g.
   
   - a) 2 parts but not equal
   - b) 4 equal parts, but only 1 should be shaded, not 3.
   - c) 4 equal parts, so 2 parts should be shaded, not 3.
   - d) 2 quarters = 1 half

   Ps come out to evaluate each diagram, explain why it is correct or why it is wrong and how to correct it. Class agrees/disagrees.

   **5 min**

2. **Fractions 2**

   What fraction of the whole unit are these shapes if:

   - a) 1 unit =
   
   - b) 1 unit =

   Ps come out to write the fraction below each shape, explaining reasoning. Who agrees? Is there another fraction it could be? Why do you think so?

   **11 min**

3. **24 hour digital clocks**

   T shows class a 24 hour digital clock. This is a clock which is different from the traditional clock. How is it different? (rectangular, no hands, time shown with digits) What time is shown on the clock?

   - e.g. 09:05 (five past nine, nine hours and 5 minutes, nine o five)

   Set your model clocks to this time. Show me them . . . now!

   T: This digital clock shows 9:05 twice a day, once in the morning (9.05 am) and once in the evening (9.05 pm). (T demonstrates)

   This digital clock (24 hour) shows 09.05 in the morning and 21:05 in the evening. Who can explain this? (T helps with explanation)

   Elicit that at midnight, the time is 00:00, then the clock counts 12 hours up to mid-day (12:00), then counts on another 12 hours to 00:00.

   The time 9.05 pm is really 12 hours + 9 hours + 5 minutes = 21 hours and 5 minutes, so the 24 hour digital clock shows 21:05.

   **16 min**

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### Activity 4

**Time sequences**

Continue this time sequence. The first term is 9:05 and the sequence is increasing by 25 minutes.


T points to some and asks Ps to the time in another way, e.g.

13:15: 1.15 pm or a quarter past one;  15:45: 3.45 pm or a quarter to 4

---

### Activity 5

**Setting the clock**

T says a time. Ps set it on their model clocks and show to T on command. T sets demonstration clock and shows as a check.

T says, or writes on BB, or shows on digital clock:

9 am, 11 o'clock, 12 am, 1 pm, 3 o'clock, 15:00, 6.30 pm, 5 minutes to midnight, twenty minutes past six, a quarter to seven, half past 10, 18:35, 00:00, midday.

---

### Activity 6

**PbY3a, page 58**

**Q.1** Read: Write the times shown on the clocks in 3 different ways.

Do part a) on BB with whole class first and show 3 different ways to write the time (hours and minutes, 12 hour clock, 24 hour clock).

Review at BB with whole class. Mistakes corrected.

**Solution:**

<table>
<thead>
<tr>
<th>a) morning</th>
<th>b) nearly midday</th>
<th>c) afternoon</th>
<th>d) evening</th>
<th>d) night</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 am</td>
<td>11 h 30 min</td>
<td>3:00 pm</td>
<td>9 h 30 min</td>
<td>11:15 pm</td>
</tr>
<tr>
<td>07:00</td>
<td>11:30 am</td>
<td>15:00</td>
<td>21:30</td>
<td>23:45</td>
</tr>
</tbody>
</table>

How would we normally read or say the time on the clocks?

(seven o'clock, half past eleven, three o'clock, etc.)

---

### Activity 7

**PbY3a, page 58**

**Q.2** Read: Draw hands on the clocks to show the times given. Write the time in a different way below each clock.

Remind Ps about position of the hour hand (points directly to a number only on a whole hour). Ps could show times on model clocks first before drawing in Pbs. Ps can choose from the other 2 ways in Activity 6 above.

Review at BB with whole class. Elicit both ways for each clock (hours and minutes and 24 hour). Mistakes corrected.

**Solution**

<table>
<thead>
<tr>
<th>a) 4:00 am</th>
<th>b) 8:30 pm</th>
<th>c) 8:30 am</th>
<th>d) 12:15 pm</th>
<th>e) 0.15 am</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 h 0 min</td>
<td>20:30</td>
<td>8 h 30 min</td>
<td>12:15</td>
<td>0 h 15 min</td>
</tr>
</tbody>
</table>

---
**Lesson Plan 58**

**Notes**

Whole class discussion

- Involve several Ps
- BB: 1 day = 24 hours
  - 1 hour = 60 minutes
  - 1 minute = 60 seconds
- BB: seconds < minutes < hours

Individual work, monitored
- Reasoning, agreement, self-correction, praising
- BB: e.g.
  - a) 2 days = 2 × 24 hours = 48 hours
  - b) 3 quarters of an hour = 60 min ÷ 4 × 3 = 15 min × 3 = 45 min

**PbY3a, page 57**

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

Revise the units of time in the question and their relationship to one another. (BB)

T shows a clock which has a second hand. Who knows how many seconds are equal to 1 minute? (60) T demonstrates on clock. Ps could count every second for, say, 10 seconds, to get an idea of how much time a second takes. Let's write the units in increasing order.

Ps fill in missing numbers in Pbs. Review at BB with whole class. If problems, check on model or real clock and write details of calculations on BB.

**Solution:**

- a) 1 hour = 60 minutes
- b) half a day = 12 hours
- 1 minute = 60 seconds
- a quarter of a day = 6 hours
- 1 day = 24 hours
- a third of a day = 8 hours
- 2 days = 48 hours
- 3 quarters of an hour = 45 min

Individual work, monitored
- Discussion, reasoning, agreement, self-correction, praising
- Write details of difficult calculations on BB: e.g.
  - a) 24 ÷ 4 = 6
  - 24 ÷ 4 × 3 = 6 × 3 = 18
  - 24 ÷ 3 = 8
  - 24 ÷ 3 × 2 = 8 × 2 = 16
  - 24 ÷ 8 = 3
  - 24 ÷ 8 = 3

**Q.4 Read:** Complete the tables.

Deal with one part at a time. Ps write details of calculations in Ex. Bks if necessary. (Differentiation by time limit.)

Review at BB with whole class. Ps come out to fill in missing numbers or T writes what Ps dictate.

Who had it all correct? Who made a mistake? What was your mistake? Who did not have enough time to finish it?


Repeat for part b).

**Solution:**

- a)

<table>
<thead>
<tr>
<th>Days</th>
<th>1</th>
<th>2</th>
<th>1 quarter</th>
<th>3 quarters</th>
<th>1 third</th>
<th>2 thirds</th>
<th>1 eighth</th>
<th>1 half</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours</td>
<td>24</td>
<td>48</td>
<td>6</td>
<td>18</td>
<td>8</td>
<td>16</td>
<td>3</td>
<td>12</td>
</tr>
</tbody>
</table>

\[ H = 24 \times D, \quad D = H \div 24, \quad H \div D = 24 \]

- b)

<table>
<thead>
<tr>
<th>Hours</th>
<th>1</th>
<th>3</th>
<th>5</th>
<th>1 half</th>
<th>1 quarter</th>
<th>1 and a half</th>
<th>1 third</th>
<th>2 thirds</th>
<th>1 sixth</th>
<th>1 fifth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minutes</td>
<td>60</td>
<td>180</td>
<td>300</td>
<td>30</td>
<td>15</td>
<td>90</td>
<td>20</td>
<td>40</td>
<td>10</td>
<td>12</td>
</tr>
</tbody>
</table>

What is the rule?

\[ M = 60 \times H, \quad H = M \div 60, \quad M \div H = 60 \]

- 45 min
## Activity

### 1 Missing items 1
Ps come out to fill in missing numbers and signs, explaining reasoning. Class points out errors.

<table>
<thead>
<tr>
<th>BB:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) $20 + 40 = 60 + 50 = 110 + 40 = 150 + 50 = 200$</td>
</tr>
<tr>
<td>b) $200 - 70 = 130 - 30 = 100 - 7 = 93 - 30 = 63$</td>
</tr>
<tr>
<td>c) $10 + 80 = 90 + 7 = 97 + 80 = 177 + 7 = 184$</td>
</tr>
<tr>
<td>d) $170 - 50 = 120 + 8 = 128 - 50 = 78 + 8 = 86$</td>
</tr>
</tbody>
</table>

(5 min)

### 2 Missing items 2
Ps come out to fill in missing numbers and signs, explaining reasoning. Class points out errors.

<table>
<thead>
<tr>
<th>BB:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) $80 \times 2 = 160 + 20 = 180 + \div 3 = 60 - 10 = 50$</td>
</tr>
<tr>
<td>b) $80 + 20 = 100 \times 2 = 200 + \div 10 = 20 - 3 = 17$</td>
</tr>
<tr>
<td>c) $80 - 20 = 60 \times 3 = 180 + \div 10 = 190 + 2 = 95$</td>
</tr>
</tbody>
</table>

(9 min)

### 3 Written exercises
T has BB or SB or OHP already prepared. T uncovers each equation one at a time, reads it and Ps copy and complete it in Ex. Bks.

<table>
<thead>
<tr>
<th>BB:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) 1 week = 7 days</td>
</tr>
<tr>
<td>b) 1 hour = 60 minutes</td>
</tr>
<tr>
<td>c) 1 day = 24 hours</td>
</tr>
<tr>
<td>d) 1 minute = 60 seconds</td>
</tr>
<tr>
<td>e) 3 quarters of a day = 18 hours</td>
</tr>
<tr>
<td>f) 2 thirds of an hour = 40 minutes</td>
</tr>
<tr>
<td>g) 120 minutes = 2 hours</td>
</tr>
<tr>
<td>h) 150 minutes = 2 hours 30 minutes (= 2 and a half hours)</td>
</tr>
<tr>
<td>i) 3 days = 72 hours</td>
</tr>
<tr>
<td>j) half a day = 12 hours</td>
</tr>
<tr>
<td>k) 1 third of a day = 8 hours</td>
</tr>
<tr>
<td>l) 3 twelfths of an hour = 15 minutes (= 1 quarter of an hour)</td>
</tr>
</tbody>
</table>

Review at BB with whole class. T writes what Ps dictate. Mistakes corrected. Write details of problem calculations on BB.

(16 min)
Activity

4 Sequences
T writes first 3 terms of a sequence on the BB. What is the rule? (increasing by 20 minutes) Let’s continue it. Ps come out to write next 3 terms and class checks that they are correct. In what other way could we write the times? (hours and minutes) Ps come out to BB to rewrite each term or T writes what Ps dictate.

BB:

a) 150 min, 170 min, 190 min, (210 min, 230 min, 250 min, . . .) 
[2 h 30 min, 2 h 50 min, 3 h 10 min, 3 h 30 min, 3 h 50 min, 4 h 10 min, . . .]
b) 200 min, 160 min., 120 min, (80 min, 40 min, 0 min) 
[3 h 20 min, 2 h 40 min, 2 h, 1 h 20 min, 40 min, 0 min]

5 Problem
Listen carefully and picture the story in your head.
A train starts its journey at 11.00 am. It stops after every quarter of an hour. It stops 8 times altogether. When does it reach its last station? Write the time it started and the times it stops in your Ex. Bks. Review at BB with whole class. Ps dictate times to T or come out to write on BB. Mistakes corrected.

BB: 11.00 am, 11.15 am, 11.30 am, 11.45 am, 12.00 noon, 12.15 pm, 12.30 pm, 12.45 pm, 1.00 pm

Answer: It reaches its last station at 1.00 pm.
Discuss the case of 12.00 noon, which is neither am (before midday) nor pm (after midday) but is midday.
Which times would change if we used the 24 hour clock? (1.00 pm would be 13:00)

6 PbY3a, page 59
Q.1. Read: Colour the odd one out. Write the reason for your choice.
What should we do first? (Write the value of each shape using the same unit to make it easy to compare). Discuss which units would be best to use. (e.g. hours)

Review at BB with whole class. X, come and show us which one you coloured and tell us why. Who agrees? Who coloured another shape? Why? etc. Calculations written on BB.

Solution:
Think of other values which add up to 1 h 55 min.

Extension

Think of other values which add up to 1 h 55 min.

Notes
Whole class activity
Ask several Ps what they think.
T gives hint if nobody knows
At a good pace
Agreement, praising
Ps might point out the pattern of the minutes:

a) 30, 50, 10, 30, 50, 10
b) 20, 40, 0, 20, 40, 0

Individual work, monitored, helped
T repeats slowly and P repeats in own words.
Reasoning, agreement, self-correction, praising

Whole class discussion
T asks several Ps what they think. Agreement, praising

Individual work, monitored, helped
Drawn on BB or use enlarged copy master or OHP
Initial discussion on strategy
Reasoning, agreement, self-correcting, praising
T repeats vague or inaccurate reasoning concisely/correctly
Reason:
Only shape which does not have value 2 hours

Whole class activity or individual work in Ex. Bks
Encourage creativity
**Lesson Plan 59**

**Notes**
- Individual work, monitored, (helped)
- Discussion, reasoning, agreement, self-correction, praising
- Write in one line on BB
- Feedback for T

**Y3**

**Activity 7**

*PbY3a, page 59*

Q.2 Read: *Write the amounts of time in increasing order.*

Review at BB with whole class. Ps dictate order to T to write on BB, explaining reasoning. Class agrees/disagrees.

<table>
<thead>
<tr>
<th>BB:</th>
<th>15 min</th>
<th>20 min</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 minutes</td>
<td>&lt;</td>
<td>1 quarter of an hour</td>
</tr>
<tr>
<td>35 minutes</td>
<td>&lt;</td>
<td>3 quarters of an hour</td>
</tr>
<tr>
<td>45 min</td>
<td>&lt;</td>
<td>half a day</td>
</tr>
<tr>
<td>12 hours</td>
<td>&lt;</td>
<td>2 quarters of a day</td>
</tr>
</tbody>
</table>

Solution:

- 10 minutes + 15 min = 25 min
- 35 minutes + 2 h + 30 min = 2 h 45 min
- 55 min + 2 h + 10 min = 2 h 55 min
- 35 min + 2 h + 53 min = 2 h 88 min

Whole class activity
- Table written on BB or use enlarged copy master or OHP
- Discussion on easiest strategy for solution
- Reasoning, calculation, agreement, praising

At a good pace
- Demonstrate on real/model clock if problems
- How else could we say/write these times?

**Activity 8**

*Look at this timetable. What does each column show? (When trains depart from Station A and when they arrive at Station B using 24 hour clock)*

Let's fill in the 3rd column to show how long each journey takes.

<table>
<thead>
<tr>
<th>Departs from Station A at:</th>
<th>Arrives at Station B at:</th>
<th>Journey time:</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:45</td>
<td>10:30</td>
<td>2 h 45 min</td>
</tr>
<tr>
<td>11:55</td>
<td>14:20</td>
<td>2 h 25 min</td>
</tr>
<tr>
<td>16:05</td>
<td>19:10</td>
<td>3 h 5 min</td>
</tr>
<tr>
<td>20:40</td>
<td>23:16</td>
<td>3 h 36 min</td>
</tr>
<tr>
<td>22:25</td>
<td>01:53</td>
<td>3 h 28 min</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BB:</th>
<th>15 min + 2 h + 30 min = 2 h 45 min</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 min</td>
<td>20 min</td>
</tr>
<tr>
<td>10 minutes</td>
<td>&lt;</td>
</tr>
<tr>
<td>35 minutes</td>
<td>&lt;</td>
</tr>
<tr>
<td>45 min</td>
<td>&lt;</td>
</tr>
<tr>
<td>12 hours</td>
<td>&lt;</td>
</tr>
</tbody>
</table>

Solution:

- 15 min + 2 h + 30 min = 2 h 45 min
- 5 min + 2 h + 20 min = 2 h 25 min
- 55 min + 2 h + 10 min = 2 h 55 min
- 35 min + 2 h + 53 min = 2 h 88 min

40 min

**Activity 9**

*PbY3a, page 59*

Q.3 Read: *Sparrow and Trout were arguing over the times in a day. Who is correct? Tick the correct answer and cross out the wrong one.*

Review with whole class. T points to each one in turn.

Who did you mark correct, Sparrow or Trout? Show me... now!

Ps put up left hand if they marked Sparrow correct and right hand if they marked Trout correct (or other agreed actions).

Ps decide on correct answer. Mistakes corrected.

Which of them had more correct? (both the same: 5 out of 9)

Solution:

- 12 hours ✓
- 4 hours ✓
- 4 quarters of a day ✓
- 4 quarters of a day ✓
- 15 minutes ✓
- 12 hours ✓
- 4 hours ✓
- 60 minutes ✓
- 20 minutes ✓
- 20 minutes ✓
- 20 minutes ✓
- 20 minutes ✓
- 20 minutes ✓
- 20 minutes ✓

45 min

Individual work, monitored, (helped)
- Use enlarged copy master or OHP
- (Ps could use rulers to make sure that the relevant values are lined up.)

Discussion, reasoning, agreement, self-correction, praising

At a good pace
- Feedback for T
<table>
<thead>
<tr>
<th>Y3</th>
<th>Lesson Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Activity</strong></td>
<td><strong>Notes</strong></td>
</tr>
<tr>
<td>Tables practice, revision, activities, consolidation <em>PbY3a, page 60</em></td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Activity</th>
<th>Notes</th>
</tr>
</thead>
</table>
| **Mental practice** | Whole class activity  
At speed  
T chooses Ps at random  
If problems, write divisions on BB  
Praising, encouragement only |
| **Problem 1** | Individual trial in *Ex. Bks*,  
then whole class discussion on how to solve it.  
T repeats slowly and Ps repeat in own words  
Reasoning, agreement, self-correction, praising |
| **Folding paper** | Whole class activity  
T demonstrates folding/cutting and Ps copy, monitored, helped  
BB:  
\[2 \times \frac{1}{2} = 1 \text{ whole}\]  
4 \(\times\) 1 quarter = 1 whole  
8 \(\times\) 1 eighth = 1 whole  
Demonstrate by manipulating the cut-out shapes on the BB  
Praising |
Lesson Plan 61

Notes

Individual work, monitored, helped
Use enlarged copy master or OHP
Reasoning, agreement, self-correction, praising
(Accept twelfths but also show the fractions in lowest form)

Whole class activity
T repeats slowly and Ps repeat in own words.

BB:

4

Activity

PbY3a, page 61

Q.1 Read: *If this is 1 unit, what is the value of each shaded part?*

T explains task. Ps count the grid squares in the whole unit (12) then the number shaded and write the fractions beside the arrows. Review at BB with whole class. Ps explain reasoning. Mistakes discussed and corrected.

BB:

- 1 unit
- 1 half (6 twelfths)
- 1 quarter (3 twelfths)
- 2 thirds (8 twelfths)
- 3 quarters (9 twelfths)
- 1 third (4 twelfths)
- 1 sixth (2 twelfths)
- 1 twelfth
- 2 sixths = 1 third

What part of each unit is not shaded?

24 min

5

Problems 2

Listen carefully, picture the story in your head and do the calculations in your Ex. Bks. Show me the answer on scrap paper when I say.

a) *Dan has 30 model airoplanes. One sixth of them are American.*
   i) How many American airoplanes does he have? (5)
   ii) What fraction of Dan’s airoplanes are not American? (5 sixths)

b) *Sue has 30 books. 1 sixth of the number of books that Liz has.*
   How many books does Liz have? (180)
Ps show answers in unison. P who answered correctly explains to others. Who agrees? Who did it a different way? Mistakes corrected.

30 min

6

PbY3a, page 61

Q.2 Read: *This is my garden. I have already dug up part of it. How much of the garden do I still have to dig? Complete the table.*

(Ps could decide on a name for the little man.) Review at BB with whole class. Mistakes corrected.

If we divided up the the garden into squares, each of side 1 m, how many metre squares would there be? (4 rows of 10 metre squares = 40 metre squares) T draws accurately on BB. This is the area of the garden (length \(\times\) width) and area is always measured in unit squares. T shows short way to write ‘metre squares’ (m\(^2\)), meaning a square with sides 1 m.

Let’s write the areas still to be dug in the table too. Ps come out to BB to do calculations and write in areas.

*Solution:*

<table>
<thead>
<tr>
<th>Part already dug</th>
<th>1 fifth</th>
<th>3 quarters</th>
<th>1 quarter</th>
<th>3 fifths</th>
<th>1 half</th>
<th>2 tenths</th>
<th>6 tenths</th>
<th>4 fifths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part remaining</td>
<td>4 fifths</td>
<td>1 quarter</td>
<td>3 quarters</td>
<td>2 fifths</td>
<td>1 half</td>
<td>8 tenths</td>
<td>4 tenths</td>
<td>1 fifth</td>
</tr>
</tbody>
</table>

| Area remaining   | 32 m\(^2\) | 10 m\(^2\) | 30 m\(^2\) | 16 m\(^2\) | 20 m\(^2\) | 32 m\(^2\) | 16 m\(^2\) | 8 m\(^2\) |

BB:

<table>
<thead>
<tr>
<th>10 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 m</td>
</tr>
</tbody>
</table>

Area = 4 m \(\times\) 10 m = 40 metre squares = 40 m\(^2\)

Reasoning, agreement, praising

Write difficult calculations on BB: e.g.

\[40 \div 5 \times 4 = 8 \times 4 = 32\]

\[40 \div 4 \times 3 = 10 \times 3 = 30\]

\[40 \div 10 \times 4 = 4 \times 4 = 16\]
Ps join up the equal fractions

35 min

© CIMT, University of Exeter
Revise standard units of capacity. Elicit that capacity is how much a container can hold. Elicit relationship of measures to one another, and which is the biggest (smallest) unit. T could have a 2 litre bottle to show.

Q.3 Read: I have already drunk 3 quarters of a 2 litre bottle of lemonade.
   a) What part of the lemonade is left?
   b) How many cl of the lemonade is left?
   c) How many cl of lemonade have I drunk?

Ps write calculations in Pbs. Review at BB with whole class. Ps explain solutions. Class agrees/disagrees or suggests other methods of solution. Draw a diagram. Mistakes corrected. Ask Ps to say the answers as sentences.

40 min

PbY3a, page 61, Q.4
Read: Write a context for the plan.
What is the problem about? (money) What data do we know from the plan? (2 thirds of an amount is £110) BB: $z = ?$
What do you think the letters stand for?
Elicit that:
$z$ is the whole amount of money,
$y$ is the amount of money which is added to £110 to make $z$,
$x$ is the fraction which is added to 2 thirds to make the whole amount.
Who can think of a problem about it? (Ps may work together in pairs for a couple of minutes.) Encourage creativity.

T asks several Ps what they thought of.
E.g. I spent £110, which was 2 thirds of my money.
   a) What part of it do I have left? (x)
   b) How much money do I have left? (y)
   c) How much money did I have to begin with? (z)

Answer: a) I have 1 third left.
        b) I have £55 left.
        c) I had £165 to begin with.

45 min

Individual work, monitored helped
BB: 1 litre = 100 cl = 1000 ml
   1 cl = 10 ml
Reasoning, agreement, self-correction, praising

BB:
   a) 4 quarters – 3 quarters = 1 quarter
   b) 2 litres = 200 cl
      200 cl ÷ 4 = 50 cl
   c) 200 cl – 50 cl = 150 cl,
      or 200 cl ÷ 4 × 3 = 50 cl × 3 = 150 cl

Whole class discussion to start Plan drawn on BB
Ask several Ps what they think.
T repeats explanations in a clearer way if necessary.

Class decides which context is best and suggests method of solution.

Solution:
   a) $x = 3$ thirds – 2 thirds
      $= 1$ third
   b) 2 thirds = £110
      $y = 1$ third = £110 ÷ 2
      = £55
   c) $z = £110 + £55 = £165$
      (i.e. 2 thirds + 1 third)
R: Mental calculation
C: Fractions. Problems in context
E: Problem solving

**Activity**

1. **Puzzle**
   - BB: Find these shapes in the grid so that the numbers in each shape sum to 200. e.g.
   - Ps come out to write numbers in shapes and show positions on grid.
   - Class checks that they are correct.

2. **Problem 1**
   - Listen carefully, picture the story in your head and think how you would solve it.
   - There are 153 children in the school playground, 33 fewer boys than girls. How many boys and how many girls are in the playground?
   - A, how would you solve it? Who agrees? Who would solve it a different way? etc. (There are several methods of solution but the most logical is as below.)
   - BB: Data: G + B = 153, G – B = 33
   - Diagram: 0 153
   - Plan: Take off the 33 more girls first, then of the number left, half will be girls and half will be boys.
   - Calculation: 153 – 33 = 120, 120 ÷ 2 = 60
   - Number of boys: 60; number of girls: 60 + 33 = 93
   - Check: 60 + 93 = 153, and 93 – 60 = 33
   - Answer: There are 60 boys and 93 girls in the playground.

3. **Problem 2**
   - Listen carefully, picture the story in your head and write a plan in your Ex. Bks. Calculate the answer and check it.
   - A carton of orange juice costs 40 p and with a straw costs 1 fifth more. What does a carton of orange juice with a straw cost altogether?
   - B, how did you work it out? Who agrees? Who did it a different way? etc. Mistakes corrected.
   - BB: Data: Carton: 40 p Straw: 1 fifth of 40 p
   - Plan: Carton: 40 p Straw: 1 fifth of 40 p
   - Calculation: 40 p + 40 p ÷ 5 = 40 p + 8 p = 48 p
   - or 40 p ÷ 5 = 8 p, 40 p + 8 p = 48 p
   - Answer: A carton with a straw costs 48 p altogether.

4. **Number sets**
   - T has cards stuck to BB. How could we group these numbers?
   - BB: Ps suggest possible ways. Let’s put them into sets of whole numbers and fractions.

**Notes**

- Whole class activity
- Drawn on BB or use enlarged copy master or OHP
- At a good pace
- Check: 5 × 40 = 200
- 2 × (80 + 20) = 2 × 100
  = 200, etc.
- Agreement, praising

- Whole class activity
- Discussion on methods of solution. Involve several Ps.
- Praise all contributions

- T suggests it if no P does so
- Ps copy into Ex. Bks.

- (Consolidate by Ps repeating problem with, e.g. 135 pupils in the playground, and 13 more boys than girls.
  - BB: 135 – 13 = 122
  - 122 ÷ 2 = 61
  - G: 61, B: 61 + 13 = 74)

- Individual work, monitored, helped
- T repeats slowly and Ps repeat in own words
- Discussion on BB.
- Reasoning, agreement, self-correction, praising
- Feedback for T

- Whole class activity
- Written on BB or use copy master, enlarged, cut out, and stuck to BB
- Discussion, agreement, praising
Ps come out to choose a card and stick in appropriate set. Class agrees/disagrees. Which is the biggest (smallest) number in each set? Let's mark the numbers on the number line. Ps come out to draw dots on first number line to show the whole numbers, then on 2nd number line to show fractions, then on 3rd number line to show whole numbers and fractions. Class agrees/disagrees.

BB: a) 

In part b), elicit that 1 unit has been divided into 12 equal parts. Why is it needed for our fractions? (So that we can find the thirds and quarters easily, because 12 can be divided by 3 and by 4 exactly)

BB: b) 

In part c):
- elicit that: 1 quarter < 1 third < 1 half < 3 quarters
- show the mathematical way to write fractions and encourage Ps to try tusing it in future.

BB: c) 

Ps come out to show where other fractions would be (e.g. 5 sixths, 7 twelfths, 1 and a half, 2 and a quarter, 3 and 3 quarters, etc.)
### Lesson Plan 62

#### Activity

**PbY3a, page 62**

**Q.1** Read: Complete the drawings.

T explains task. Elicit that 1 whole unit is $2 \times 12 = 24$ grid squares. How many squares are in 1 half (1 sixth, 1 eighth, 1 third) of the unit? (12, 4, 3, 8)

Ps complete the drawings in Pb. Review at BB with whole class. Mistakes corrected. What part is left? (half, 5 sixths, etc.)

**Solution:** e.g.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 half</td>
<td></td>
</tr>
<tr>
<td>1 sixth</td>
<td></td>
</tr>
<tr>
<td>1 eighth</td>
<td></td>
</tr>
<tr>
<td>1 third</td>
<td></td>
</tr>
</tbody>
</table>

**Notes**

- Individual work, monitored, helped
- Drawn on BB or use enlarged copy master or OHP
- Agreement, praising
- Extra praise for creative solutions, e.g. 1 sixth:

**Ps read problem silently first**

T asks questions to test Ps’ understanding

**Discussion, agreement**

BB: $240 \div 12 = 20$ m

Do first part with whole class first

Diagram drawn on BB or use enlarged copy master or OHP

**Reasoning, agreement, self-correcting, praising**

#### Notes

Ps read problem silently first

T, Z: $240 - 160 = 80$ m

C: $240 - 180 = 60$ m

J, S: $240 - 120 = 120$ m

(or use fractions: e.g.

T: $240 \div 6 \times 2 = 80$ m)

---

**Extension**

**PbY3a, page 62**

**Q.2** Read: Five children are running in a 240 m race.

What are the names of the children in the race?

How long is the track from start to finish? (240 m) What do you notice about it? (divided into 12 equal parts, i.e. twelfths)

What distance is each part? (20 m)

Everyone put your finger on Tom. How far has he run?

(4 sixths of the distance) X, come and show us where you think Tom has got to. Who agrees? Let’s mark it with a dot.

How far has Tom run? BB: $240 \div 6 \times 4 = 40 \times 4 = 160$ m

Let’s write it below Tom’s dot.

Rest done as individual work, reviewed with whole class, or continue as whole class activity.

**Solution:**

**Start**

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tom</td>
</tr>
<tr>
<td>160 m</td>
</tr>
</tbody>
</table>

**Finish**

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>160 m</td>
</tr>
</tbody>
</table>

How far away is each child from the finishing line?

**Answer:**

- Joe spent £160.
- Gerry and Joe spent £300 altogether.

---

**Notes**

- Individual work, monitored, helped
- Make sure that Ps realise that Joe’s amount is 1 seventh more, not just 1 seventh!

**Reasoning, agreement, self-correction, praising**
MEP: Feeder Primary Project

Lesson Plan

Week 13

Y3

R: Calculations
C: Practice: numbers, fractions, time
E: Challenges and puzzles

Activity

1

Equal values
Let's find the equal values. Agree on different ways of showing them (e.g. underlining and circling, or using different colours).
BB:

a) \begin{align*}
56 + 78 & \quad 56 + 70 + 8 \\
56 + 8 + 70 & \quad 56 + 8 + 80 \\
56 + 8 + 20 & \quad 56 + 2 + 80 \\
56 + 8 + 20 & \quad 56 + 2 + 90
\end{align*}

b) \begin{align*}
123 - 94 & \quad 123 - 90 - 4 \\
123 - 3 - 90 - 1 & \quad 123 - 3 - 1 - 90 \\
123 - 4 - 90 & \quad 123 - 100 + 6
\end{align*}

Problem 1
Listen carefully, picture the story in your head and write the important data in your Ex. Bks. Write a plan, do the calculation and solve it.

A school dinner lady needs 9 eggs to make a large bacon and egg pie. How many pies could she make with 140 eggs?

Ps sit up with arms folded when finished. Wait until most of the class have solved it. T asks several Ps for their answer.

A, come and explain how you worked it out. Who agrees? Who did it a different way? etc. Discuss all mistakes.

BB: e.g. \begin{align*}
9 \text{ eggs} & \rightarrow 1 \text{ pie} \\
140 \text{ eggs} & \rightarrow (140 \div 9) \text{ pies}
\end{align*}

Answer: She could make 15 pies. 5 eggs will be left over.

Problem 2
The rabbit family are having dumplings for lunch. How many dumplings has Mrs Rabbit made? (36)

BB:

\begin{align*}
\bigcirc \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc \\
\bigcirc \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc \\
\bigcirc \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc \\
\bigcirc \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc
\end{align*}

T reads out the fraction each rabbit ate. Ps come out to BB to write calculations and colour appropriate numbers of dumplings.

a) Ricky Rabbit ate 1 sixth of the dumplings. (BB: \(36 \div 6 = 6\))

b) Jenny Rabbit ate 1 third of the dumplings. (BB: \(36 \div 3 = 12\))

c) Cilla Rabbit ate 1 quarter of the dumplings. (BB: \(36 \div 4 = 9\))

d) Tim Rabbit ate 1 ninth of the dumplings. (BB: \(36 \div 9 = 4\))

What other questions can you think of to ask? e.g.

- Who ate most (fewest) dumplings? (Jenny: 12, Tim: 4)
- Were all the dumplings eaten? (No, 5 were left)

BB: \(6 + 12 + 9 + 4 = 31\), \(36 - 31 = 5\)

Notes

Whole class activity
T has BB or SB or OHP already prepared
Ps come out to BB, explaining reasoning
Class agrees/disagrees
At a good pace
Extra praise if Ps notice that there is no need to do each calculation.

Individual work, monitored, helped
T repeats slowly and Ps repeat in own words
(Or Ps show with number cards or on scrap paper)
Reasoning, agreement, self-correcting, praising
Feedback for T

Whole class activity
Drawn on BB or OHP or pictures of dumplings cut out and stuck to BB

T could have text written on BB (SB or OHT) and uncover each section as required.
Reasoning, agreement, praising
(with help of T/class if needed)

T asks questions if Ps cannot think of any.
Agreement, praising
Lesson Plan 63

**Notes**

Individual work, monitored, (helped)
Drawn on BB or use enlarged copy master or OHP
Differentiation by time limit
Reasoning, agreement, self-correction, praising

**Bold** numbers are given

Feedback for T

---

**Activity**

<table>
<thead>
<tr>
<th>4</th>
<th>PbY3a, page 63</th>
</tr>
</thead>
</table>
| Q.1 Read:  *Each number is the sum of the two numbers directly below it. Fill in the missing numbers.*  

Review at BB with whole class. Ps dictate numbers to T (or come to BB to write them in), explaining reasoning. Class agrees/disagrees. Mistakes corrected.  

**Solution:**

a)  

<table>
<thead>
<tr>
<th></th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>123</td>
<td>77</td>
</tr>
<tr>
<td>65</td>
<td>58</td>
</tr>
<tr>
<td>18</td>
<td>11</td>
</tr>
<tr>
<td><strong>8</strong></td>
<td><strong>8</strong></td>
</tr>
</tbody>
</table>

b)  

<table>
<thead>
<tr>
<th></th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>140</td>
<td>60</td>
</tr>
<tr>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td><strong>10</strong></td>
<td><strong>10</strong></td>
</tr>
<tr>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>20</td>
<td><strong>80</strong></td>
</tr>
</tbody>
</table>

---

**Notes**

Individual work, monitored, (helped)
Drawn on BB or use enlarged copy master or OHP
Differentiation by time limit
Reasoning, agreement, self-correction, praising

**Bold** numbers are given

Feedback for T

---

**Activity**

<table>
<thead>
<tr>
<th>5</th>
<th>PbY3a, page 63</th>
</tr>
</thead>
</table>
| Q.2 Read:  *Each number is the product of the two numbers directly below it. Fill in the missing numbers.*  

Review at BB with whole class. Ps dictate numbers to T (or come to BB to write them in), explaining reasoning. Class agrees/disagrees. Mistakes corrected.  

**Solution:**

a)  

<table>
<thead>
<tr>
<th></th>
<th>500</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>1</td>
<td><strong>2</strong></td>
</tr>
</tbody>
</table>

b)  

<table>
<thead>
<tr>
<th></th>
<th>120</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td><strong>5</strong></td>
</tr>
</tbody>
</table>

---

**Activity**

<table>
<thead>
<tr>
<th>6</th>
<th>PbY3a, page 63, Q.3</th>
</tr>
</thead>
</table>
| Read:  *In a school, each lesson starts on the hour and lasts for 45 minutes.*  

**a)** What part of an hour is:  

i) each lesson,  

ii) each break?  

How could we solve it? T asks several Ps what they think.  

**BB:**  

1 hour = 60 minutes  

i) Lesson: 3 quarters of an hour = 45 minutes  

ii) Break: 1 quarter of an hour = 15 minutes  

Read: b)  

*The lessons start at 09:00 and lunch is at 13:00. How many lessons are there during the morning?*  

Ps come out to show start times of lessons on model clock:  

09:00, 10:00, 11:00, 12:00  

There are 4 lessons in the morning.  

Read: c)  

*How many hours and minutes do pupils spend:*  

i) in lessons  

ii) in breaks?  

Ps discuss how to solve it. T writes what Ps dictate:  

i) Time in lessons: 4 × 45 min = (4 × 40 + 4 × 5) min = (160 + 20) min = 180 min = 3 hours  

ii) Time in breaks: 4 × 15 min = (4 × 10 + 4 × 5) min = (40 + 20) min = 60 min = 1 hour  

Pupils spend 3 hours in lessons and 1 hour in breaks.

---

**Notes**

Whole class activity  
(or individual work, monitored and reviewed)  
Allow Ps to suggest methods of solution  
Demonstrate on model clock where necessary  
Reasoning, agreement, praising  

Ps write answers in Pbss too  
Details of calculations may be done in Ex. Bks.  

or  

i) 4 × 3 quarters of an hour = 12 quarters of an hour = 4 quarters + 4 quarters + 4 quarters = 3 hours  

ii) 4 × 1 quarter of an hour = 4 quarters of an hour = 1 hour  

*Check:* 3 h + 1 h = 4 h
**Lesson Plan 63**

**Notes**

Individual work, monitored (helped)

Drawn on BB or use enlarged copy master or OHP

Reasoning, agreement, self-correction, praising

Elicit, e.g., that:

- 2 tenths = 1 fifth
- finding 1 fifth and then 1 half of something is the same as finding 1 tenth, i.e. $100 \div 5 \div 2 = 100 \div 10$

---

**Activity 7**

*PbY3a, page 63*

Q.4 Read: *Fill in the missing items.*

Review at BB with whole class. Mistakes corrected.

**Solution:**

\[a) \quad 100 \quad \text{1 fifth} \quad 20 \quad \text{1 half} \quad 10 \quad \text{1 tenth}\]

\[b) \quad 100 \quad \text{2 fifths} \quad 40 \quad \text{1 half} \quad 20 \quad \text{1 fifth}\]

\[c) \quad 200 \quad \text{1 fifth} \quad 40 \quad \text{1 half} \quad 20 \quad \text{1 tenth}\]

\[d) \quad 100 \quad \text{2 tenths} \quad 20 \quad \text{1 half} \quad 10 \quad \text{1 tenth}\]

What do you notice about the diagrams? Discuss relationships and connections.

---

**Activity 8**

**What is missing?**

Study the table. What do you think are the missing shapes?

BB:

<table>
<thead>
<tr>
<th>Unit</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Shape</td>
<td></td>
</tr>
<tr>
<td>Value of shape</td>
<td>2 thirds</td>
</tr>
</tbody>
</table>

Ps come to BB to choose a column and draw the shape, explaining reasoning. Class agrees/disagrees.

Ps suggest other units and values which could be added to table.

---

**Extension**

Whole class activity

Table drawn on BB or use enlarged copy master or OHP

Discussion, reasoning, agreement, praising

Feedback for T

Extra praise for creative suggestions
## Lesson Plan 64

### Activity

#### 1 Mental practice

T asks a question. Ps say answers, explaining reasoning.

- **a)** Which number is: 56 less than 124? (124 – 56 = 68)
- **b)** Which number is 56 more than 124? (124 + 56 = 180)
- **c)** What is the sum of 56 + 124? (180)
- **d)** What is the difference between 124 and 56? (68)
- **e)** 124 is 56 less than which number? (124 + 56 = 180)
- **f)** 124 is 56 more than which number? (124 – 56 = 68)

5 min

#### 2 Written exercises

T reads out calculations. Ps write them in Ex. Bks and work out the answers too. Ps nod heads when they have done each one. Deal with one part at a time. Review orally round class. Ps change pencils and mark/correct own work. Who had all 8 correct? etc.

- **a)** 78 + 4 × 8 = (78 + 32 = 110), 87 + 8 × 4 = (87 + 32 = 119)
- **b)** 97 + 4 × 8 = (97 + 32 = 129), 8 × 3 + 87 = (24 + 87 = 111)
- **c)** 9 × 3 + 78 = (27 + 78 = 105), 87 + 9 × 4 = (87 + 36 = 123)
- **d)** 79 + 3 × 8 = (79 + 24 = 103), 78 + 4 × 4 = (78 + 16 = 94)

Let’s write the results in increasing order. T writes as dictated by Ps.

BB: 94 < 103 < 105 < 110 < 111 = 111 < 119 < 123

- **g)** 95 + 80 ÷ 4 = (95 + 20 = 115), 95 + 80 ÷ 8 = (95 + 10 = 105)
- **h)** 95 + 160 ÷ 8 = (95 + 20 = 115), 95 + 160 ÷ 4 = (95 + 40 = 135)

Let’s write the results in decreasing order. T writes as dictated by Ps.

BB: 135 > 115 = 115 > 105 > 99 > 94 > 88 > 83

5 min

#### 3 Problem

This is how Minnie Mouse usually spends her day. T reads out statements and Ps come to BB to write in hours spent on each activity, explaining reasoning. Class agrees/disagrees.

- **a)** She sleeps for 1 third of the day. 8 hours
- **b)** She plays for 1 eighth of the day. 3 hours
- **c)** She is at school for 1 quarter of the day. 6 hours
- **d)** She visits friends for 1 sixth of the day. 4 hours
- **e)** She teases the cat for 1 twelfth of the day. 2 hours

How long does she have left do her homework? BB: (8 + 3 + 6 + 4 + 2) hours = 23 hours; (24 – 23) hours = 1 hour

**Answer:** Minnie Mouse has 1 hour left to do her homework.

What do you think of Minnie’s daily schedule? Should she organise her time better?

10 min

### Notes

Whole class activity
T chooses Ps at random
Reasoning, agreement
Calculations written on BB if necessary, e.g.

- 124 + 56 = 124 + 50 + 6

Individual work, monitored, helped
Written on BB or use enlarged copy master or OHP
Reasoning, agreement, self-correction, evaluation, praising

All mistakes discussed and corrected
Ps suggest easy way to do calculations, e.g.

- 78 + 32 = 78 + 2 + 20 + 10
- 79 + 24 = 80 + 20 + 3

If problems, show on class number line.
Ps list increasing/decreasing orders in Ex. Bks too.

Feedback for T

Whole class activity
Picture or drawing of Minnie Mouse stuck to BB (or use other cartoon character)

BB: 1 day = 24 hours
T could have text written on BB (SB or OHT) and uncover each section as required.
Reasoning, agreement, praising (with help of T/class if needed)

Ps dictate what T should write.

Discussion. In good humour!
(or whole activity is based on Ps’ suggestions)

15 min
Lesson Plan 64

**Y3**

### Activity 4

**PbY3a, page 64**

**Q.1 Read:** Complete each given part to 2 whole units.

Elicit how many thirds (quarters, fifths) there are in 2 whole units. Ps complete diagrams, counting the grid squares to help them. Review at BB with whole class. Mistakes corrected.

**Solution:**

<table>
<thead>
<tr>
<th></th>
<th>a) 1 third</th>
<th>b) 1 quarter</th>
<th>c) 1 fifth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>6 thirds</td>
<td>2</td>
<td>10 fifths</td>
</tr>
</tbody>
</table>

Who can complete these parts to 2 whole units?

**BB:**

d) 5 quarters
e) 4 sixths

Ps come out to BB to draw missing parts, explaining reasoning. Class agrees/disagrees.

### Extension

**Fractions of money**

Alice saved up her pocket money. She used a quarter of it to buy Christmas presents.

Let’s complete the table to show how much money she could have saved, how much she could have spent and how much money she could have left. (Elicit that, e.g., £4.80 means £4 80 p)

**BB:**

<table>
<thead>
<tr>
<th></th>
<th>Saved</th>
<th>Spent</th>
<th>Had left</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>£10</td>
<td>£2.50</td>
<td>£7.50</td>
</tr>
<tr>
<td></td>
<td>£8</td>
<td>£2</td>
<td>£6</td>
</tr>
<tr>
<td></td>
<td>£2</td>
<td>50 p</td>
<td>75 p</td>
</tr>
<tr>
<td></td>
<td>£2</td>
<td>50 p</td>
<td>75 p</td>
</tr>
<tr>
<td></td>
<td>£1.20</td>
<td>30 p</td>
<td>90 p</td>
</tr>
<tr>
<td></td>
<td>£4.80</td>
<td></td>
<td>£3.60</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>£3.75</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Elicit that £1 = 100 p, and 1 quarter of £1 = 100 p ÷ 4 = 25 p

Ps come to BB to choose a column and fill in the missing values.

---

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Week 13

Lesson Plan 64

Notes

Whole class activity
Discussion, reasoning, agreement, praising
Elicit that, e.g.
1 fifth of a half = 1 tenth
1 half of 1 third = 1 sixth, etc.
or
200 \div 2 \div 5 = 200 \div 10 = 20
Ps write this equation in Pbs
or
180 \div 3 \div 2 = 180 \div 6 = 30
Ps write this equation in Pbs
or
360 \div 3 \div 2 = 360 \div 6 = 60
Ps write this equation in Pbs
or
180 \div 3 \div 2 = 180 \div 6 = 3
Ps write this equation in Pbs

Individual work, monitored, helped
Use enlarged copy master or OHP
Agreement, self-correction, praising
Feedback for T

Whole class activity
(or individual work if Ps wish)
Drawn on BB or use enlarged copy master or OHP
Discussion on strategy
Reasoning, agreement, praising
Check solution is correct, e.g.
BB:
2 \times 4 \times 2 \times 4 = 8 \times 8 = 64
2 \times 2 \times 4 \times 10 = 4 \times 40 = 160, etc.
<table>
<thead>
<tr>
<th>Y3</th>
<th>Lesson Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity</td>
<td>Notes</td>
</tr>
</tbody>
</table>
| Practice, revision, activities, consolidation  
*PbY3a, page 65* | |

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Y3

**Activity**

1. **Money model**
   - a) Make £10 in different ways. Encourage logical strategy.
     - Review at BB quickly with whole class. Ps dictate to T which coins or notes to stick on BB. e.g.
     - $\begin{align*}
     10 & \quad 10 \\
     20 & \quad 10 \\
     30 & \quad 10 \\
     40 & \quad 10 \\
     50 & \quad 10 \\
     60 & \quad 10 \\
     70 & \quad 10 \\
     80 & \quad 10 \\
     90 & \quad 10 \\
     100 & \quad 10
     \end{align*}$
   - b) Make £100 with £10 notes. Review as above.
   - c) Make £1000 with £100 notes. Review as above.

   How many 100s did you use? (10)
   - Let's count them: ‘100, 200, 300, 400, 500, 600, 700, 800, 900, 1000’
   - Let's put 10, 100 and 1000 in a place-value table. What does each heading stand for? (Thousands, Hundreds, Tens and Units)
   - BB: Ps come out to write digits in the correct columns.

2. **Hundreds, tens and units**
   - Ps each have on desks: 5 ‘hundred’ squares, 10 ‘strips of 10’ and 10 unit squares.
   - How many unit squares are in the large square? (10 × 10 = 100)
   - How many unit squares are in the long strip? (10)
   - How many strips are in the large square? (10)
   - a) Using the 100 squares, the 10 strips and the unit squares, show me on your desks the number 324.
   - BB:

     $$\begin{align*}
     324
     \end{align*}$$

   Who can write 324 in the place value table? Ps come to BB.
   - Let's check it (324 = 3 hundreds + 2 tens + 4 units)
   - b) Ps stick own elements on BB and the class reads the number aloud T chooses Ps to say how many hundreds, tens and units.
   - c) Ps write a number in the place value table and ask other Ps to say how many tens (hundreds, units).

---

**Notes**

- Paired work, monitored, Ps have model money on desks (£1 and £2 coins and £5, £10 and £100 notes
  - Set a time limit
  - Discussion, agreement, praising
  - BB: $10 \times £10 = 100$
  - Helped. T notes which Ps know what 1000 means.
  - BB: $10 \times 100 = 1000$
  - In unison
  - Whole class activity
  - Table drawn on BB

- Whole class activity
  - Use copy master, enlarged on to card and cut out (use different coloured card for each value if possible, or plastic squares, strips, etc. if school has a set)
  - Individual work, monitored, helped
  - Agreement, praising
  - (Use magnets or blue-tack stuck to back of card)

- Place-value table drawn on BB
  - BB:

    $$\begin{align*}
    324
    \end{align*}$$

  - In unison
  - Agreement, praising
  - Praising, encouragement only

---

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### Activity

#### 3

**Unit cubes**

Which number is shown? Ps come to the BB to count the unit cubes in each row or layer.

**BB:**

- **a)** $100 + 40 + 3 = 143$
- **b)** $500 + 70 + 6 = 576$

**How many unit cubes are there altogether?**

**BB:**

\[
100 + 500 + 40 + 70 + 3 + 6 = 600 + 110 + 9
\]

\[
= 600 + 100 + 10 + 9
\]

\[
= 719
\]

16 min

### Notes

**Lesson Plan 66**

#### Whole class activity

- Drawn on BB or use enlarged copy master or OHP, or large multilink cubes
- If possible, Ps could also have sets already made up on desks

#### Discussion, agreement, praising

(Practice in understanding 3-D diagrams)

T writes what Ps dictate

### Extension

**PbY3a, page 66**

#### Q.1 Read: How many small squares are in the drawing?

Elicit that in each large square there are $10 \times 10 = 100$ unit squares, and in each vertical (horizontal) strip there are 10 unit squares. (Ps might need magnifying glasses!)

Ps count the number of hundreds, tens and units and write the digits in the appropriate columns in the table.

Review with whole class. Mistakes corrected. Do the addition with the whole class.

**How many unit squares are there altogether?** Ps come to BB to add up the columns. Class agrees/disagrees.

(T could ask for total of parts a) and b), or b) and c) before, or instead of, the total of all three, depending on the ability of Ps.)

**What do you notice?** (13 units is enough to make 1 whole ten and 3 units. Let's move the 1 whole ten into the tens column (making 11 tens).

What else do you notice? (11 tens is enough to make 1 hundred and 1 ten) Let's move the 1 hundred into the hundreds column. (making 11 hundreds)

Elicit that 11 hundreds is enough to make 1 thousand and 1 hundred. Let's move the thousand into the thousands column (making 2 thousands).

Let's all read the total: '2 thousand, 1 hundred and thirteen'

12 min

### Notes

**Individual work, monitored, helped**

- Use enlarged copy master or OHP
- Discussion, reasoning, self-correcting, praising

**BB:**

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>8</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>b)</td>
<td>2</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>c)</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1098</strong></td>
<td><strong>1277</strong></td>
<td></td>
</tr>
</tbody>
</table>

Accept 13 units, 10 tens, etc. as correct but then extend to show how to reallocate to the other columns.

Discussion, agreement, praising

In unison

21 min
### Activity 5

**Addition**

Look at these diagrams. What can you tell me about them?

(10 × 10 = 100 dots in large squares, 10 dots in each row or column)

**BB:**

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Deal with one part at a time. Ps write number on scrap paper and show on command. Ps who responded incorrectly come out to BB to count again (with help of class) and write digits in table.

How many dots are there altogether? Ps come out to add up each column and then reallocate (with T's help) the 10 hundreds to the thousands column. Show how the 1 thousand can be written below the column to remind Ps to include it when adding up the thousands.

**Notes**

Whole class activity
Use enlarged copy master or OHP or stick coloured dots on squares (strips) of paper and stick to BB.

T uncovers one part at a time

**Discussion, agreement, praising**

**BB:**

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>1</td>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>

Ps read total in unison (with T's help)

**Individual work, monitored, helped**

Agreement, self-correction, praising

Feedback for T

---

### Activity 6

**PbY3a, page 66**

**Q.2** Read: *How many dots are in the drawings? Write the numbers in the table.*

(Less able Ps are only expected to write the digits in the correct columns.) Review at BB with whole class. Mistakes corrected.

Ps who did the addition come out to BB to explain their reasoning. Who did the same? Who had another total? etc.

If nobody did the addition, T works through it with help of class.

Let's read the total together: 'two thousand and twenty-one'.

**Notes**

Individual work, monitored, helped

Use enlarged copy master or OHP or draw table on BB

Reasoning, agreement, self-correction, praising

**BB:**

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>9</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Ps read total in unison (with T's help)

---

### Activity 7

**Mental practice**

a) T says, e.g. '4 times tens, P₁ says '4 times 10 equals 40';
T says '4 times 1 hundred', P₂ says '4 times 100 equals 400'.

Repeat for 4 × 50, 4 × 500, 7 × 10, 7 × 100, 7 × 20, 7 × 200, etc. If problems, write multiplication on BB.

**Notes**

Whole class activity
At speed round class
Class points out errors
Praising, encouragement only
Feedback for T

---

### Activity 8

**PbY3a, page 66**

**Q.3** Read: *Write these numbers as digits. List them in increasing order.*

Review at BB with whole class. Mistakes corrected. Elicit that to put in order, you look at the hundreds first, then the tens, then the units.

**BB:**

253 < 652 < 605 < 651 < 920 < 999

**Notes**

Individual work, monitored, (helped)
Agreement, self-correction, praising
Feedback for T
<table>
<thead>
<tr>
<th>Activity 9</th>
<th>Lesson Plan 66</th>
</tr>
</thead>
</table>

**PbY3a, page 66**

Q.4  **Read:** *Write these numbers in words.*

- T chooses Ps to read the numbers aloud first, then Ps write as words in *Pbs.*
- Review at *BB* with whole class. Ps correct mistakes in words and spelling.

**BB:**  
- a) 304 three hundred and four  
- b) 430 four hundred and thirty  
- c) 403 four hundred and three  
- d) 910 nine hundred and ten  
- e) 109 one hundred and nine  
- f) 901 nine hundred and one

- **45 min**

**Notes**

- Individual work, monitored, (helped)  
- (Ps can find several of the words needed in Q.3 in *Pbs*)  
- Agreement, self-correction  
- Praising, encouragement only
Lesson Plan

Y3

Week 14

Activity

1

Number line

Let’s mark these numbers on the number lines. Deal with one part at a time. Ps come out to mark numbers with a dot or a cross.

a) 0, 3, 7, 10  
b) 0, 30, 70, 100  
c) 0, 300, 700, 1000

What is the connection between the number lines?

Elicit that:

\[ b = 10 \times a, \quad c = 10 \times b, \quad c = 100 \times a \]

and, e.g.

\[ 3 \times 10 = 30, \quad 30 \times 10 = 300 = 3 \times 100 \]
\[ 10 \times 10 = 100, \quad 100 \times 10 = 1000 = 10 \times 100 \]

2

Sequences

a) The first term is 100, and each following term is 100 more than the previous one. (Ps: 100, 200, 300, 400, 500, . . . )

b) Continue this sequence. What is the rule? (increasing by 50)

\[ T: 200, 250, 300, 350, (P: 400, 450, 500, 550, . . .) \]

c) The first term is 1000. Each following term is 20 less than the previous one. (Ps: 1000, 980, 960, 940, . . . )

3

Find the mistakes

I meant to write the same number in different ways, but I have made some mistakes. Can you find them? A, what do you think? Who agrees? Who thinks something else etc.

BB:

```
one hundred and ninety three
1 hundred, 9 tens and 3 units
100 + 93
1 \times 100 + 9 \times 1 + 3 \times 10
100 + 30 + 9
```

All should have value 193, so 100 + 30 + 9 should be 100 + 90 + 3 and 1 \times 100 + 9 \times 1 + 3 \times 10 should be 1 \times 100 + 9 \times 10 + 3 \times 1

4

PbY3a, page 67

Q.1 Read: Barry Bear tried to write the same number in different ways but he made some mistakes. Cross out the mistakes and correct them.

Review at BB with whole class. Elicit that the numbers were all supposed to be 945, but there were 2 mistakes:

- 900 + 50 + 4 should have been 900 + 40 + 5
- 90 + 45 should have been 90 + 45

In what other ways can you make 945?

Notes

Whole class activity

Number lines drawn on BB or use enlarged copy master or OHP

At a good pace

Agreement, praising

Involve several Ps

T repeats vague or inaccurate statements correctly.

T gives hints if necessary.

Whole class activity

At speed in relay round class

If a P makes a mistake, the next P corrects it.

T may point to numbers on the number line if necessary

Praising

Whole class activity

Drawn on BB or use enlarged copy master or OHP, or cards stuck to BB

Ps come out to BB to point to mistakes and explain how they can be corrected

Reasoning, agreement, praising

Individual work, monitored

Drawn on BB or use enlarged copy master or OHP

Reasoning, agreement, self-correcting, praising

Agreement, praising
### Activity 5

**Making 3-digit numbers**

a) Let's list all the 3-digit numbers which you could make from the digits 2, 7 or 8. Discuss how to do it in a logical way.

Ps try it in Ex. Bks first. Review at BB with whole class.

Ps dictate to T what to write.

BB:

```
2 7 8
2 2 2
2 7 7
2 7 7
2 7 7
2 7 7
```

Could we have known that there are 27 possible numbers before listing them all? Elicit that for each of the 3 possible hundreds digit, there are 3 possible tens digits and 3 possible units digits.

b) Let's tick the numbers which contain 3 different digits. (6 numbers)

Could we have known that there are 6 such numbers before ticking them all? Elicit that for each of the 3 numbers chosen as the hundreds digit, there are 2 possible tens digits, but then only 1 possible units digit: 278, 287, 728, 782, 827, 872.

---

### Lesson Plan 67

**Notes**

- Initial whole class discussion on strategy
- Individual trial in Ex. Bks first or Ps can use number cards (Could be a timed competition)
- BB: 2, 7, 8
- Discussion, agreement, self-correction, praising

27 possible numbers

- Agreement, praising
  - BB: \(3 \times 3 \times 3 = 27\) possible numbers
- Ps come to BB and class keeps count
- Agreement, praising
  - BB: \(3 \times 2 \times 1 = 6\) possible numbers.

---

### Activity 6

**PhY3a, page 67**

**Q.2** Read: Create as many different 3-digit numbers as you can from the digits 1, 2, 3 and 4.

Do not use a digit more than once in any number.

Ps can draw tree diagrams in Ex. Bks first or manipulate number cards on desks, then list the possible numbers in Pbs.

B, how many did you write? (e.g. 24) Who had the same? Who had more (less)? B, come and explain to us how you did it.

BB:

```
1 3 4
1 3 2
1 3 4
1 3 2
```

Why are there 24 possible numbers? (For each of the 4 numbers possible as the hundreds digit, there are 3 possible tens digits, then 2 possible units digits.)

Let's tick the even numbers. Ps dictate to T. (12 possible)

---

**Notes**

- Individual work, monitored, helped
- Set a time limit

Discussion at BB

Reasoning, agreement, self-correcting, praising

- BB: \(4 \times 3 \times 2 = 24\)
- Elicit that a 3-digit number is even if the units digit is even.
### Y3

<table>
<thead>
<tr>
<th>Activity 7</th>
<th>Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) How many 2-digit whole tens are there? (9) What are they? Ps: '10, 20, 30, 40, 50, 60, 70, 80, 90'</td>
<td></td>
</tr>
<tr>
<td>b) How many whole numbers are there which are more than 10 and less than 20? (9) What are they? Ps: '11, 12, 13, 14, 15, 16, 17, 18, 19'</td>
<td></td>
</tr>
<tr>
<td>c) How many 2-digit numbers are there? (90) Elicit that for each of the 9 possible tens digits there are 10 possible units digits (0 to 9).</td>
<td></td>
</tr>
<tr>
<td>d) How many 3-digit numbers are there? (900) Elicit that for each of the 9 possible hundreds digits, there are 10 possible tens digits (0 to 9), then 10 possible units digits.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Extension 8</th>
<th>Pby3a, page 67</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q.3 Read: Which numbers was Daffy Duck thinking of? T makes sure that Ps understand the diagrams. Review at BB with whole class. Mistakes corrected</td>
<td></td>
</tr>
<tr>
<td>Solution:</td>
<td></td>
</tr>
<tr>
<td>a) 444</td>
<td></td>
</tr>
<tr>
<td>b) i) 200 + 10 + 4 = 213</td>
<td></td>
</tr>
<tr>
<td>ii) 300 + 11 × 10 + 5 = 300 + 110 + 5 = 415</td>
<td></td>
</tr>
<tr>
<td>iii) 500 + 50 + 9 = 559</td>
<td></td>
</tr>
<tr>
<td>iv) 400 + 12 = 412</td>
<td></td>
</tr>
<tr>
<td>v) 300 + 30 + 3 = 333</td>
<td></td>
</tr>
<tr>
<td>Let's list them in increasing order. T writes what Ps dictate. BB: 213 &lt; 333 &lt; 412 &lt; 415 &lt; 559</td>
<td></td>
</tr>
<tr>
<td>Who can come and underline the odd numbers? Who agrees?</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity 9</th>
<th>Which is more?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ps come out to BB in pairs. Class chooses 3 digits. One P writes the smallest possible 3-digit number and the other the largest, writing the correct sign between them to show which is more. They each read their numbers aloud and say whether it is odd or even. Class agrees/disagrees. Next pair of Ps writes the numbers in words. Class agrees/disagrees. Repeat for other pairs of Ps and different digits. (Include zero for able Ps.)</td>
<td></td>
</tr>
</tbody>
</table>

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Lesson Plan
68

R: Mental calculation
C: Counting, reading, writing and ordering numbers
E: Numbers up to 2000

Y3

Activity

1 Sequences
a) The first term is 400. Each following term is 30 more than the previous one. Ps: 400, 430, 460, 490, 520, . . .
b) T says the first 3 terms of a sequence and Ps continue it. 800, 760, 720, (680, 640, 600, 560, . . .) What is the rule? (decreasing by 40)

5 min

2 PbY3a, page 68
Q.1 Read: What is the rule? Continue the sequence for another 10 terms.
Review orally with whole class. A, read us your numbers. Who agrees? etc. B, what is the rule? (decreasing by 6)
Solution: 700, 694, 688, (682, 676, 670, 664, 658, 652, 646, 640, 634, 628)
Let's continue the sequence.

5 min

3 Writing numbers
Write these numbers as digits in your Ex. Bks.
a) i) six hundred and thirty five b) i) 909
ii) nine hundred and twenty ii) 405
iii) 7 hundreds, 3 tens and 8 units iii) 450
iv) one thousand iv) 613
v) 2 hundred and ninety v) 599
Review at BB with whole class. Mistakes corrected.
Let's write them in increasing order. Ps dictate what T (or P) should write.
BB: 290 < 405 < 450 < 599 < 613 < 635 < 738 < 909 < 920 < 1000
Which are the odd (even) numbers?

15 min

4 PbY3a, page 68
Q.2 Read: Colour with the same colour or join up the equal numbers.
Ps decide which method they want to use.
Review at BB with whole class. Mistakes discussed and corrected. If problems, refer to number line.
Solution:

8 hundreds + 8 tens + 19 units
94
3 hundreds + 8 units
480
2 hundreds + 2 tens + 10 units
531
5 hundreds + 3 tens + 1 unit

50 + 10 + 34
500 + 20 + 10
900 – 1
2 hundreds + 200 units + 8 tens

5 hundreds + 2 tens + 10 units

531 < 899

Let's put them in increasing order. T writes what Ps dictate or Ps come to BB to rearrange cards.

20 min

Notes
Whole class activity
T chooses Ps at random
At speed
If a P makes a mistake, next P corrects it.
Agreement, praising

Individual work, monitored, (helped)
Agreement, self-correcting, praising

Orally at speed round the class

Individual work, monitored
Part a) already written on BB or SB or OHT
Part b) read by T
Agreement, self-correction, praising
Ps come out to show approximate position on number line (0 to 1000 – use copy master for Activity 7)
Agreement, praising

Individual work, monitored, helped
Written on BB or use enlarged copy master or OHP (or cards enlarged, cut out and stuck to BB)
Reasoning, agreement, self-correction, praising

BB: 94 < 308 < 480 < 530

Praising
**Activity 5**

**True or false?**
Study these numbers.

<table>
<thead>
<tr>
<th>340</th>
<th>1000</th>
<th>957</th>
<th>599</th>
</tr>
</thead>
<tbody>
<tr>
<td>242</td>
<td>409</td>
<td>378</td>
<td></td>
</tr>
</tbody>
</table>

a) Let's read them in increasing (decreasing) order.

b) Who can come and write the smallest (largest) in words?
(Two Ps come to BB to write: two hundred and forty two < one thousand)

c) I will say something about these numbers. If you think that the statement is true stand up but if you think it is false, put your hands on your heads when I say. (Or other agreed actions)

i) At least one of the numbers is even. Show me . . . now! (True)

ii) Most of the numbers are odd. Show me . . . now! (False)

iii) None of the numbers is greater than 1 thousand. (True)

iv) Only one number is a whole ten. Show me . . . now! (False)

v) Every number is greater than 250. Show me . . . now! (False)

---

**Notes**

Whole class activity
T has BB or SB or OHP already prepared

In unison at speed
Class agrees/disagrees

Responses shown in unison
In good humour!

---

**Activity 6**

**Roman numerals**

What do you think the table shows? (Row A shows the whole numbers from 1 to 26, Row R shows them as Roman numerals)

BB:

<table>
<thead>
<tr>
<th>A</th>
<th>I</th>
<th>V</th>
<th>X</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>10</td>
<td>20</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

Revise Roman numerals: I, V, X, VI = V + I, IV = V – I

Let's complete the table. Ps come to BB to choose a column and fill in the missing value, explaining reasoning. Class points out mistakes.

---

**Notes**

Whole class activity
Drawn on BB or use enlarged copy master or OHP
At a good pace
Agreement, praising

Ps can add own numbers to end of table

---

**Activity 7**

**PbY3a, page 68**

Q.3 Read: Write the odd numbers smaller than 600 in set A. Write the even numbers greater than 800 in set B. Choose from the numbers in set U.

Ps write numbers in correct set, scoring each out from set U as it is dealt with. Discuss where to put numbers not in sets A or B.

Review at BB with whole class. Two Ps come out to BB to write numbers in correct sets. Class agrees or disagrees and corrects mistakes.

Let's mark the positions of the numbers on the number line.

BB:

---

**Notes**

Individual work, monitored
Drawn on BB or use enlarged copy master or OHP

Reasoning, agreement, self-correction, praising

Whole class activity
Number line drawn on BB or use enlarged copy master or OHP
(Positions need only be approximate)

Praising
Lesson Plan 68

**Q.4 Read:** Complete the table.

T explains task, doing first number with whole class if necessary. Rest done as individual work.

Review at BB with whole class. Ps come out to BB to write and explain. Class agrees/disagrees. Mistakes corrected.

**Solution:**

<table>
<thead>
<tr>
<th></th>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td>568</td>
<td>5</td>
<td>100</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>173</td>
<td>1</td>
<td>100</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>902</td>
<td>9</td>
<td>100</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>430</td>
<td>4</td>
<td>100</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>1245</td>
<td>1</td>
<td>1000</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>1050</td>
<td>1</td>
<td>1000</td>
<td>0</td>
<td>100</td>
</tr>
</tbody>
</table>

**Abacus bingo**

T has number cards 0 to 9 in a box or opaque bag. Each P has a blank ‘abacus’ sheet. Ps are divided into three teams, A, B and C. T reads out 4 numbers for each team and Ps write them down in the boxes below each abacus.

T chooses Ps to come to front of class, withdraw a card (with their eyes shut) and stick it on BB. If that digit appears in any of the numbers, Ps draw the appropriate number of dots in the correct column (thousands, hundreds, tens or units).

Ps stand up when they have completed all the digits for all their numbers. T makes sure that solutions are correct. Winning team is first to stand up with all correct.

**Solution:**

a) 1 5 4 9  
   b) 1 5 0 4  
   c) 1 8 5 0  
   d) 1 0 6 1

b) 1 3 2 7  
   b) 1 3 0 2  
   c) 1 6 3 1  
   d) 1 0 2 6

C  
   a) 1 6 5 3  
   b) 1 5 6 0  
   c) 1 7 3 2  
   d) 1 0 6 8

Whole class activity

Copies of enlarged copy master already on desks.
(Or T writes numbers on sheet before photocopying)
At a good pace
Pupils in the same team can help each other.
Agreement, praising
Stars, stickers, etc. awarded

(Or copy master used for individual work:
T has numbers written in words on BB or SB or OHT and Ps draw dots and write as digits on sheet)
<table>
<thead>
<tr>
<th>Activity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong></td>
<td><strong>Lesson Plan</strong></td>
</tr>
<tr>
<td><strong>Sequences</strong></td>
<td><strong>69</strong></td>
</tr>
<tr>
<td>a) The first term is 700. Each following term is 100 more than the previous one. Let's say the terms up to 2000:</td>
<td>Whole class activity</td>
</tr>
<tr>
<td>Ps: '700, 800, 900, 1000, 1100, 1200, 1300, 1400, . . ., 2000'</td>
<td>T chooses Ps at random</td>
</tr>
<tr>
<td>b) T says the first 3 terms of a sequence and Ps continue it.</td>
<td>At speed</td>
</tr>
<tr>
<td>2000, 1950, 1900,</td>
<td>If a P makes a mistake, next</td>
</tr>
<tr>
<td>What is the rule? (decreasing by 50)</td>
<td>P corrects it.</td>
</tr>
<tr>
<td><strong>5 min</strong></td>
<td>Agreement, praising</td>
</tr>
<tr>
<td><strong>2</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Comparing numbers</strong></td>
<td>T helps with drawing the arrows.</td>
</tr>
<tr>
<td>Let's compare these numbers. Which is more? Ps come out to BB to draw arrows pointing towards the number which is greater.</td>
<td>Reasoning, agreement, praising</td>
</tr>
<tr>
<td>BB:</td>
<td>(There should be 14 arrows)</td>
</tr>
<tr>
<td>Let's write them in increasing order. T writes what Ps dictate.</td>
<td>Agreement, praising</td>
</tr>
<tr>
<td>BB: 584 &lt; 1209 &lt; 1297 &lt; 1526 &lt; 1608</td>
<td></td>
</tr>
<tr>
<td><strong>10 min</strong></td>
<td></td>
</tr>
<tr>
<td><strong>3</strong></td>
<td><strong>Whole class activity</strong></td>
</tr>
<tr>
<td><strong>Archery competition</strong></td>
<td>Drawn on BB or use enlarged copy master or OHP</td>
</tr>
<tr>
<td>In an archery competition, these were the targets of the 4 competitors. What did they score? Who won the competition?</td>
<td>Make sure that all Ps know what archery is.</td>
</tr>
<tr>
<td>T (or P) explains what the rings in each target mean. Ps come out to choose a target and work out the score, explaining reasoning. Class agrees/disagrees.</td>
<td>At a good pace</td>
</tr>
<tr>
<td>BB: a)</td>
<td>Reasoning, agreement, praising</td>
</tr>
<tr>
<td>b)</td>
<td>If problems, write details on BB:</td>
</tr>
<tr>
<td>c)</td>
<td>a) 1000 + 300 + 40 = 1340</td>
</tr>
<tr>
<td>d)</td>
<td>b) 900 + 50 = 950</td>
</tr>
<tr>
<td></td>
<td>c) 1000 + 100 + 70 = 1170</td>
</tr>
<tr>
<td></td>
<td>d) 1000 + 500 + 20 = 1520</td>
</tr>
<tr>
<td>Let's put the scores in decreasing order. T writes what Ps dictate.</td>
<td>Agreement, praising</td>
</tr>
<tr>
<td>d &gt; a &gt; c &gt; b</td>
<td>Discussion. Ask several Ps what they think.</td>
</tr>
<tr>
<td>Which competitor is the winner? (d)</td>
<td>Extra praise if Ps suggest it.</td>
</tr>
<tr>
<td>Let's mark each score on the number line. Ps come out to draw dots.</td>
<td></td>
</tr>
<tr>
<td>Why do you think some targets have more marks than others? (In a competition, all competitors would have had the same number of arrows, but some arrows would have missed the targets.)</td>
<td></td>
</tr>
</tbody>
</table>
Sets
T has a set of numbers written on the BB. Let's call this set of numbers set B:
BB: \( B = \{ 0, 45, 60, 90, 110, 283, 500, 505, 600, 1416, 1450, 1500, 1804, 1860, 2000 \} \) [written on one line if possible]

If we wanted to divide them up into two smaller sets (subsets), how could we do it? Ps suggest different ways.

I have already started using these labels. Could you help me complete them? First let's underline (circle or score out) the numbers I have done.

Ps come out to write in remaining numbers. Class agrees/disagrees.

Discuss the cases of 0 and 500. Where should they go? (Still in Set B but in neither of the subsets)

**Solution:**

![Sets Diagram]

Individual work, monitored, helped

**Extension**

**PbY3a, page 69**

Q.1 Read: Write the numbers from set A in the correct boxes.

Deal with one part at a time. Decide on how to mark off the numbers as they are dealt with, e.g. underlining in part a), circling in part B, ticking in part c), or using colours.

Review each part at BB with whole class before moving on to next part. Mistakes corrected.

Discuss the cases of 0 and 74 in part b) and 1000 in part c).

**Solution:**

![Sets Diagram]

What fraction of set A is in the subset on the LHS (RHS)?

- a) LHS: 6 tenths = 3 fifths
  - RHS: 4 tenths = 2 fifths
- b) LHS: 3 tenths
  - RHS: 5 tenths = 1 half
- c) LHS: 4 tenths = 2 fifths
  - RHS: 5 tenths = 1 half
Activity

Place value

6

a) List the 4-digit numbers which have 1 as the thousands digit, 5 as the hundreds digit, 4 as the tens digit and only odd units.
Elicit that the number s will be of the form 154\[\square\]
P s write the possible numbers in their Ex. Bks. Review at BB with whole class. Mistakes corrected.

b) List the 4-digit numbers which have 1 as the thousands digit, 5 as the hundreds and units digits, and tens digit less than 5.
Elicit that the numbers will be of the form 15\[\square\]5.
P s write the possible numbers in their Ex. Bks. Review at BB with whole class. Mistakes corrected.

c) List the 4-digit numbers which have 1 as the thousands digit, the biggest possible hundreds digit, 5 as the tens digit and the smallest possible units digit.
P s write the number in their Ex. Bks. Review at BB with whole class. Mistakes corrected.

Comparing numbers

7

Let’s fill in the missing numbers and compare them. What signs could we choose from? (\(<\), \(\geq\), \(\leq\))

BB:

a) \(1\ \text{Th} + 5\ \text{H} + 9\ \text{U} = \underline{1509}\ \bigcirc\ \underline{1505}\ = 1\ \text{Th} + 5\ \text{T} + 9\ \text{U}\)

b) \(1\ \text{Th} + 4\ \text{H} + 6\ \text{T} = \underline{1460}\ \bigcirc\ \underline{1505}\ = 1\ \text{Th} + 6\ \text{T} + 4\ \text{U}\)

c) \(1\ \text{Th} + 7\ \text{H} + 5\ \text{U} = \underline{1705}\ \bigcirc\ \underline{1725}\ = 1\ \text{Th} + 7\ \text{H} + 2\ \text{T} + 5\ \text{U}\)

d) \(1\ \text{Th} + 6\ \text{H} + 42\ \text{U} = \underline{1642}\ \bigcirc\ \underline{1642}\ = 1\ \text{Th} + 64\ \text{T} + 2\ \text{U}\)

Ps come to BB to fill in missing digits and signs. Class agrees/disagrees. Where one number is more, ask how many more. (BB)
If problems, show on number line.

PbY3a, page 69

Q.2 a) Read: Add 12 to each number in A and write the result in B.
Review quickly with whole class. Mistakes corrected.

b) Read: Decide whether the statements are true or false.
Write a tick or cross in the box.

T chooses Ps to read each part. Class writes a tick or cross in the box. Is it true or false? Show me . . . now!.
P s explain reason for choice. Class agrees on correct response.

Solution:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>111</td>
<td>+12</td>
</tr>
<tr>
<td>112</td>
<td>+12</td>
</tr>
<tr>
<td>113</td>
<td>+12</td>
</tr>
<tr>
<td>122</td>
<td>+12</td>
</tr>
<tr>
<td>123</td>
<td>+12</td>
</tr>
<tr>
<td>133</td>
<td>+12</td>
</tr>
<tr>
<td>222</td>
<td>+12</td>
</tr>
<tr>
<td>223</td>
<td>+12</td>
</tr>
<tr>
<td>233</td>
<td>+12</td>
</tr>
<tr>
<td>333</td>
<td>+12</td>
</tr>
</tbody>
</table>

i) False, e.g. 311 is missing
ii) True
iii) True

Notes

Individual work in Ex. Bks but class kept together
T repeats descriptions slowly
Reasoning, agreement, self-correction, praising
BB:

a) 154\[\square\]
1541, 1543, 1545, 1547, 1549

b) 15\[\square\]5
1505, 1515, 1525, 1535, 1545

c) 1950
(Or Ps could show on scrap paper on command)

Feedback for T
Whole class activity
Written on BB or use enlarged copy master or OHP
Discussion, agreement, praising
BB:

a) 1509 – 1059 = 500 – 50 = 450

b) 1460 – 1064 = 400 – 4 = 396

c) 1725 – 1705 = 20

Individual work for part a), monitored
Table drawn on BB or use enlarged copy master or OHP
Whole class activity
Responses shown in unison
(Actions agreed beforehand, e.g. holding ears for true, knocking on desk for false, or writing T or F on scrap paper)
Reasoning, agreement, self-correction, praising
<table>
<thead>
<tr>
<th>Y3</th>
<th>Lesson Plan 70</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Activity</strong></td>
<td><strong>Notes</strong></td>
</tr>
</tbody>
</table>
| Practice, revision, activities, consolidation  
*PbYa, page 70* | |
### Lesson Plan

#### Week 15

<table>
<thead>
<tr>
<th>Activity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Y3</strong></td>
<td></td>
</tr>
<tr>
<td>R: Mental calculation</td>
<td></td>
</tr>
<tr>
<td>C: Operations with whole tens and hundreds up to 1000</td>
<td></td>
</tr>
<tr>
<td>E: Numbers up to 2000</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lesson Plan 71</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Notes</strong></td>
</tr>
<tr>
<td>Whole class activity</td>
</tr>
<tr>
<td>T chooses Ps at random</td>
</tr>
<tr>
<td>At speed</td>
</tr>
<tr>
<td>If a P makes a mistake, next P corrects it.</td>
</tr>
<tr>
<td>Agreement, praising</td>
</tr>
<tr>
<td>Ps might notice the pattern of endings in a) and b)</td>
</tr>
</tbody>
</table>

### Activity 1

#### Sequences

- **a)** The first term is 420. Each following term is 50 more than the previous one. What is the sequence?
  - Ps: '420, 470, 520, 570, 620, 670, 720, 770, ...)

- **b)** T says the first 3 terms of a sequence and Ps continue it.
  - 1000, 991, 982, (973, 964, 955, 946, ...)
  - What is the rule? (decreasing by 9)

**5 min**

### Activity 2

#### PbY3a, page 71

**Q.1** Read: Which numbers sit on the rungs of the number ladders? Fill in the missing numbers.

Review at BB with whole class. Elicit that each ladder shows a number sequence. What is the rule for each one?

- (LHS: decreasing by 30; RHS: increasing by 8)

**10 min**

### Activity 3

#### Number sets

T has cards stuck randomly to side of BB and drawings of the animals stuck to centre. Sheep, Owl and Duck are collecting operations which have certain values. Sheep collects those with value 720, Owl collects those with value 700 and Duck collects those with value 820. T writes the values being collected below the animals.

Let’s help them sort out all these cards. Ps come to BB to choose a card, say the complete operation and stick below relevant animal. Class agrees/disagrees.

**Solution:**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>720</td>
<td>700</td>
<td>820</td>
</tr>
<tr>
<td>320 + 400</td>
<td>440 + 260</td>
<td>900 – 80</td>
</tr>
<tr>
<td>1000 – 280</td>
<td>900 – 200</td>
<td>650 + 170</td>
</tr>
<tr>
<td>900 – 180</td>
<td>180 + 520</td>
<td>750 + 70</td>
</tr>
<tr>
<td>600 + 120</td>
<td>840 – 140</td>
<td>960 – 140</td>
</tr>
</tbody>
</table>

**Extension** Who can think of other operations for each animal?

**15 min**

### Activity 4

#### PbY3a, page 71

**Q.2** Read: Practise calculation. Write the digits in the correct boxes.

What do you notice about the operations? (6 rows of 3, i.e. 18 altogether; 2nd column is 1st column multiplied by 10; 3rd column is 1st column multiplied by 100)

Let’s see how many of them you can do in 3 minutes!

Start ... now! ... Stop!

Review orally round the class. Ps change pencils and mark and correct own work. Who had 18 (17, 16, 15), etc correct?

**20 min**

---

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Y3

Activity

5

Written exercises
T dictates an equation (e.g. ‘340 plus something is equal to 800’ Ps copy into Ex. Bks and solve it.

a) \( 340 + \frac{460}{170} = 800 \)

b) \( 920 - \frac{520}{80} = 400 \)

c) \( \frac{170 + 420}{280} = 590 \)

d) \( 800 - \frac{80}{60} = 720 \)

e) \( 640 + \frac{280}{30} = 920 \)

f) \( 760 - 320 = 440 \)

g) \( 390 + \frac{30}{60} = 420 \)

h) \( 300 - \frac{60}{80} = 240 \)

Review at BB with whole class. Ps come out to BB to write in missing number (or dictate it to T) explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected.

Elicit that to find the missing:

- number being added, subtract the original number from the sum;
- original number, subtract the number being added from the sum;
- number being subtracted, subtract the difference from the original number;
- original number in a subtraction, add the number being subtracted to the difference.

25 min

6

Problem

Listen carefully, picture the story in your head and think how you would solve it.

Anna and Emma are playing a board game with model money. They have won £1600 altogether. Emma has won £800 more than Anna. How much money has each girl won? X, how would you solve it? Who agrees? Who would solve it a different way? etc. (There are several methods of solution but the most logical is given below.)

BB: Data: \( A + E = £1600, \ E - A = £800 \)

Diagram:

\[
\begin{array}{c}
100 \\
100
\end{array} \quad \begin{array}{c}
100 \\
100
\end{array} \quad \begin{array}{c}
100 \\
100
\end{array} \quad \begin{array}{c}
100 \\
100
\end{array} \quad \begin{array}{c}
100 \\
100
\end{array}
\]

Anna Emma Emma

Plan: Take off the £800 more won by Emma, then of the amount left, half will be Anna’s and half will be Emma’s.

Calculation: \( £1600 - £800 = £800, \ £800 \div 2 = £400 \) or \( (£1600 - £800) \div 2 = £800 \div 2 = £400 \)

Anna: £400; Emma: £400 + £800 = £1200

Check: £1200 + £400 = £1600, and £1200 - £400 = £800

Answer: Anna has won £400 and Emma has won £1200.

30 min
### Y3

#### Activity

<table>
<thead>
<tr>
<th>7</th>
<th>Multiplication and division</th>
</tr>
</thead>
<tbody>
<tr>
<td>T says a multiplication or division, Ps do calculation in <em>Ex. Bks.</em></td>
<td></td>
</tr>
<tr>
<td>Review with whole class. Mistakes discussed and corrected. Ps point out connections/relationships.</td>
<td></td>
</tr>
<tr>
<td>a) $6 \times 3 = (18)$</td>
<td>$6 \times 30 = (180)$</td>
</tr>
<tr>
<td>b) $16 \div 8 = (2)$</td>
<td>$160 \div 8 = (20)$</td>
</tr>
<tr>
<td>c) $7 \times 8 = (56)$</td>
<td>$7 \times 80 = (560)$</td>
</tr>
<tr>
<td>d) $32 \div 4 = (8)$</td>
<td>$320 \div 8 = (80)$</td>
</tr>
</tbody>
</table>

### Notes

Individual work, monitored
Ps nod heads when they have completed each one.
T has BB or SB or OHP already prepared and uncovers one operation at a time.
Discussion, agreement, self-correction, evaluation, praising

#### Lesson Plan 71

<table>
<thead>
<tr>
<th>8</th>
<th>PbY3a, page 71</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q.3 Read: <em>Practise multiplication and division.</em></td>
<td></td>
</tr>
<tr>
<td>Let’s see how many of them you can do in 3 minutes!</td>
<td></td>
</tr>
<tr>
<td>Start . . . now! . . . Stop!</td>
<td></td>
</tr>
<tr>
<td>Review orally round the class. Ps change pencils and mark and correct own work. Who had them all correct? Who made a mistake? What was your mistake? Who did the same? Who does not understand what they did wrong? etc.</td>
<td></td>
</tr>
</tbody>
</table>

### Notes

Individual work, monitored
Differentiation by time limit
Reasoning, agreement, self-correcting, praising
Write details on BB if problems, e.g.
$270 \div 90 = 27$ tens $\div 9$ tens $= 3$ tens $= 30$

#### Lesson Plan 71

<table>
<thead>
<tr>
<th>9</th>
<th>PbY3a, page 71</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q.4 Read: <em>Study the numbers in set A. Complete the sentences so that they are correct.</em></td>
<td></td>
</tr>
<tr>
<td>What can you tell me about these numbers? (e.g. some even, some odd; some 2-digit, some 3-digit; one whole ten, one has no tens; all less than 1000, none less than 30, etc.)</td>
<td></td>
</tr>
<tr>
<td>Ps complete sentences in <em>Pbs.</em> Review orally with whole class. Deal with all responses. Class agrees whether they are valid.</td>
<td></td>
</tr>
<tr>
<td>Solution: e.g.</td>
<td></td>
</tr>
<tr>
<td>a) All these numbers (are whole numbers).</td>
<td></td>
</tr>
<tr>
<td>b) Not all these numbers (are 3-digit numbers).</td>
<td></td>
</tr>
<tr>
<td>c) None of these numbers (are 1-digit numbers).</td>
<td></td>
</tr>
<tr>
<td>d) There is at least one number which (is less than 100).</td>
<td></td>
</tr>
</tbody>
</table>

### Notes

Individual work, monitored, helped
Initial whole class discussion
Praise all contributions
Reasoning, agreement, self-correcting, praising
Many other responses possible
Extra praise for creativity
Week 15

Lesson Plan

72

Y3

R: Mental calculation
C: Operations with whole tens and hundreds (up to 1000)
E: Numbers up to 2000

Activity

Chain operations
Which numbers do the letters stand for?

BB:

\[
\begin{align*}
800 & \quad -40 \\
a & \quad -80 \\
b & \quad +110 \\
c & \quad -70 \\
d & \quad +280 \\
e & \quad \quad \quad \quad
\end{align*}
\]

Ps come out to BB to write an equation for each letter and solve it. Class agrees/disagrees. (P turns over card to confirm result.)

BB:

\[
\begin{align*}
a &= 800 - 40 = 760 \\
b &= 760 - 80 = 680 \\
c &= 680 + 110 = 790 \\
d &= 790 - 70 = 720 \\
e &= 720 + 280 = 1000
\end{align*}
\]

If the arrows pointed in the opposite direction, what would the operations be?

5 min

2 puzzles

BB: a) Study this puzzle. What could the rule be? Ask several Ps what they think. (The sum of any two adjacent numbers is the number directly above them.)

Ps come out to BB one at a time to fill in numbers and explain reasoning. Class points out errors.

b) This puzzle has all its numbers complete. Let's start from a number in the bottom row and find a path to the top so that all the numbers passed through add up to 1000.

Try out the calculations in your Ex. Bks first. As soon as Ps have additions, they show them on the BB and class checks that they are correct.

BB: e.g. 

\[
\begin{align*}
260 + 140 + 350 + 170 + 80 &= 1000 \\
280 + 190 + 130 + 320 + 80 &= 1000 \\
210 + 190 + 350 + 170 + 80 &= 1000, \text{ etc.}
\end{align*}
\]

10 min

Finding the rule

Study this table. What is the rule? T asks several Ps what they think. Agree on one form of the rule (e.g. number in top row + number in bottom row add up to 500)

Ps come out to choose a column and fill in missing number, explaining reasoning. Class agrees/disagrees.

Who can write the rule in a mathematical way? Who agrees? Who can think of another way? etc.

Solution:

\[
\begin{align*}
\bigstar & \quad 340 \quad 120 \quad 160 \quad 250 \quad 380 \\
\bigcirc & \quad 160 \quad 380 \quad 340 \quad 250 \quad 420 \quad 410 \quad 70 \quad 330
\end{align*}
\]

Rule: \( \bigstar + \bigstar = 500, \quad \bigstar = 500 - \bigcirc, \quad \bigcirc = 500 - \bigstar \)

15 min

Notes

Whole class activity

Drawn on BB or use enlarged copy master or OHP

T also has the letters written on coloured cards stuck to BB (with number represented written on back of each one)

Reasoning, agreement, praising

Feedback for T

BB: \( 1000 - 280 + 70 - 110 + 80 + 40 = 800 \)

Whole class activity

Drawn on BB or use enlarged copy master or OHP

At a good pace

Discussion, reasoning, agreement, praising

Individual trial in Ex. Bks

Reviewed with whole class

Reasoning, checking, agreement, praising

Whole class activity

Drawn on BB or use enlarged copy master or OHP

At a good pace

Discussion, agreement, checking, praising

Feedback for T

Bold numbers are given

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### **Lesson Plan 72**

**Notes**

Whole class activity

Drawn on BB or use enlarged copy master or OHP

Reasoning, agreement, praising

Discuss the fact that the squares forming 1 quarter of the value are also 1 quarter of the area of the rectangle: 24 squares ÷ 4 = 6 squares

Ps suggest how to calculate it

Agreement, praising

---

**Y3**

### Activity

**4. Equal values**

Let's divide up the rectangle into 4 equal parts so that the sum of the numbers in each part is 390. How could we do it?

Ps come to BB to draw a line around each part and class checks that numbers sum to 390.

**BB:**

<table>
<thead>
<tr>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
<th>110</th>
<th>120</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>10</td>
<td>30</td>
<td>20</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>100</td>
<td>40</td>
<td>50</td>
<td>40</td>
<td>50</td>
<td>60</td>
</tr>
<tr>
<td>110</td>
<td>120</td>
<td>60</td>
<td>90</td>
<td>80</td>
<td>70</td>
</tr>
</tbody>
</table>

What fraction of the value of the rectangle is each part? (1 quarter)

What is the value of the whole rectangle?

\[(4 \times 390 = 4 \times 300 + 4 \times 90 = 1200 + 360 = 1560)\]

---

**5. Inequalities**

Which numbers could the letters stand for to make the inequalities correct? Ps come out to BB to write possible digits. Who agrees? Who thinks something else? etc. Let's read the inequality using each of the possible digits. If problems, show on number line.

**BB:**

a) \(456 > \boxed{a} 56\)  
\(a: 3, 2, 1\)

b) \(596 < \boxed{b} 6\)  
\(b: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9\)

c) \(\boxed{c} 54 < 5 \boxed{c} 4\)  
\(c: 4, 3, 2, 1\)

d) \(2 \boxed{d} 8 < \boxed{d} 258\)  
\(d: 4, 3, 2, 1, 0\)

e) \(\boxed{e} 66 < \boxed{e} 66\)  
\(e: 7, 8, 9\)

f) \(\boxed{f} 3 > 493\)  
\(f: \) impossible

---

**6. PbY3a, page 72**

Q.1 Let's see how many of these you can do in 3 minutes.

Look for connections between the numbers to help you.

Elicit that there are 4 × 5 = 20 additions and subtractions.

Start . . . now! . . . Stop! Review orally round class. Ps change pencils and mark/correct their own work, then count how many correct out of 20.

Who had all correct (1, 2, 3, 4, 5, more than 5 mistakes)? What were your mistakes? Who did the same? etc.

Write details of problem calculations on BB:

\[\begin{align*}
1350 + 480 &= 1350 + 400 + 80 = 1750 + 80 \\
(1350 + 480 &= 1330 + 500 = 1750 + 50 + 30 \\
&= 1800 + 30 = 1830)
\end{align*}\]

**Solutions:**

\[
\begin{align*}
26 + 13 &= 39 \\
260 + 130 &= 390 \\
58 - 32 &= 26 \\
580 - 320 &= 260 \\
18 + 42 &= 60 \\
180 + 420 &= 600 \\
70 - 21 &= 49 \\
700 - 210 &= 490 \\
56 + 44 &= 100 \\
560 + 440 &= 1000 \\
100 - 59 &= 41 \\
1000 - 590 &= 410 \\
135 + 48 &= 183 \\
1350 + 480 &= 1830 \\
146 - 18 &= 128 \\
1460 - 180 &= 1280 \\
164 + 36 &= 200 \\
1640 + 360 &= 2000 \\
200 - 35 &= 165 \\
2000 - 350 &= 1650
\end{align*}
\]

---

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Y3

Activity 7

PbY3a, page 72

Q.2 Let’s see how many of these you can do in 3 minutes. Look for connections between the numbers to help you. Elicit that there are \(4 \times 6 = 24\) multiplications/divisions. Start... now! ... Stop! Review orally round class.

Ps change pencils and mark/correct their own work, then count how many correct out of 24. Who had all correct (1, 2, 3, 4, 5, more than 5 mistakes)? Discuss mistakes and connections.

Lesson Plan 72

Notes

Individual work, monitored, (helped)

Differentiation by time limit

Reasoning, agreement, self-correction, evaluation, praising

Stars, stickers awarded for good work

---

8

PbY3a, page 72, Q.3

Read: Write numbers in the circles so that the sum of the 3 numbers along each line is 1000.

Choose from 260, 280, 300, 320, 340, 360, 380, 400.

Discuss strategy for solution. First Ps list possible combinations of numbers and T writes them in a logical order on the BB. Ps then suggest arrangement in ellipses by trial and error.

Possible groups of 3 numbers (omitting repeats of combinations):

- 260 + 280 + ? is not possible  
- 260 + 300 + ? is not possible  
- 260 + 320 + ? is not possible  
- 260 + 340 + 400 = 1000 ✓  
- 260 + 360 + 380 = 1000 ✓  
- 280 + 300 + ? is not possible  
- 280 + 320 + 400 = 1000 ✓  
- 280 + 360 + 380 = 1000 ✓  
- 280 + 340 + ? is not possible  
- 280 + 360 + ? is not possible

Elicit that only 6 sets of numbers are possible.

(N.B. Using algebra is too difficult at this stage.)

---

9

PbY3a, page 72

Q.4 Read: Write the numbers as Roman numerals.

Revise the Roman numerals already known, referring to shaded sections of diagram. Deal with one part at a time.

Review at BB with whole class. Mistakes corrected.

Solution:

- a)  
- b)  
- c)  

Individual work, monitored, helped

(Or whole class activity if short of time)

Use enlarged copy master or OHP

Discussion, agreement, self-correction, praising

(Less able Ps could use enlarged copy of copy master)
### Activity 1

#### Roman numerals

Let's see if you can remember the Roman numerals. T writes Roman digits on BB and Ps dictate the Arabic equivalents:

- **BB:**  
  - I = (1)  
  - V = (5)  
  - X = (10)  
  - L = (50)  
  - C = (100)  
  - D = (500)  
  - M = (1000)

The Romans used only these 7 digits to make all their numbers. Look back to page 72 in your Pbs to see how they did it. Who can explain to us how they did it? (using addition and subtraction)

Let's show it with some examples. T starts equations and Ps come to BB to complete them. Rest of class copy into Ex. Bks.

**a)** BB:  
- 2 = 1 + 1 = I + I = II  
- 20 = 10 + 10 = X + X = XX  
- 200 = 100 + 100 = C + C = CC  
- 2000 = 1000 + 1000 = M + M = MM

**b)** They did the same for the numbers 3, 300 and 3000. Who can come and write them on the BB? Rest of class copies into Ex. Bks.

- BB: 3 = 1 + 1 + 1 = I + I + I = III,  
- 300 = 100 + 100 + 100 = C + C + C = CCC  
- 3000 = 1000 + 1000 + 1000 = M + M + M = MMM

**c)** What did they do for the number 4? (Subtracted 1 from 5)  
Who can come and write it on the BB? Who can show 40, 400?  
BB:  
- 4 = 5 – 1 = V – I = IV,  
- 40 = 50 – 10 = L – X = XL  
- 400 = 500 – 100 = D – C = CD

**d)** What did they do for the number 6? (Added 1 to 5)  
Ps come to show 6, 60, 600 on BB:  
BB:  
- 6 = 5 + 1 = V + I = VI,  
- 60 = 50 + 10 = L + X = LX  
- 600 = 500 + 100 = D + C = DC

Let’s see if you can write the numbers 7, 8 and 9 (70, 80, 90 and 700, 800, 900) in your Ex. Bks. Elicit that 7 = 5 + 2, 8 = 5 + 3, BUT 9 = 10 – 1. Ps who finish first come out to write on BB:  
BB:  
- 7 = VII  
- 8 = VIII  
- 9 = IX

8 min

**2**

#### Practice with Roman numerals

T says a number and Ps come up to BB to write in Roman numerals. Class points out errors.

**BB:**  
- e.g. 48 = 40 + 8 = (50 – 10) + (5 + 1 + 1 + 1) = XLVIII  
- 1999 = 1000 + (1000 – 100) + (100 – 10) + (10 – 1) = MCMXCIX  

Do you think it is useful to know the Roman numerals? When would we use them? (e.g. lists, clocks, dates on buildings or monuments, at the end of TV programmes, but mainly in history).

13 min

### Notes

- Whole class activity
- Or Ps come to write on BB
- Ask several Ps what they think
- Agreement, praising
- Reasoning, agreement, praising
- BUT point out, e.g. that the Romans did not use:  
  - VV (5 + 5) for 10,  
  - LL (50 + 50) for 100

Elicit that the smaller unit being subtracted is written **before** the larger unit and that the smaller unit being added is written **after** the larger unit. The order is important!

- Note that, e.g:  
  - MCM = 1000 + 900 = 1900  
  - but ≠ 1100 + 1000 = 2100  
  - How would 2100 be written? (MMC)

Elicit that the most that can be added of any unit is 3, then subtraction is used.

- Agreement, praising

- Whole class activity
- With T’s (Ps’) help
- Ps can suggest numbers.
- Discussion involving several Ps. T could tell Ps where to see Roman numerals in local area (or some Ps might know).
### Activity 3

**PbY3a, page 73**

Q.1 Read: Write these numbers as Roman numerals.

- Ps may refer to *Ex. Bks* or *Pb* page 72 to help them.
- Review at BB with whole class. T chooses Ps to read out their answers. Class checks by doing the addition. Mistakes corrected.

**Solution:**

<table>
<thead>
<tr>
<th>Solution</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) 100 + (50 + 10) + (1 + 1) = CLXII</td>
<td>(162)</td>
</tr>
<tr>
<td>b) (500 + 100) + (50 – 10) + (1 + 1) = DCXII</td>
<td>(642)</td>
</tr>
<tr>
<td>c) 1000 + (500 + 100) + 1 = MDCI</td>
<td>(1601)</td>
</tr>
<tr>
<td>d) (1000 – 100) + (50 + 10) + 5 = CMLXV</td>
<td>(965)</td>
</tr>
<tr>
<td>e) 1000 + (100 + 100) + (5 + 1) = MCCVI</td>
<td>(1206)</td>
</tr>
<tr>
<td>f) (500 + 100 + 100) + (10 + 10 + 10) = DCCXXX</td>
<td>(730)</td>
</tr>
</tbody>
</table>

---

### Activity 4

**PbY3a, page 73**

Q.2 Read: How many pence do these items cost?

- Write the amounts as Arabic numbers.

Review at BB with whole class. Mistakes corrected.

Point out that in Roman form, a smaller number may be longer to write! What would the prices be in £s?

**Solution:**

<table>
<thead>
<tr>
<th>Solution</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) XXIV</td>
<td></td>
</tr>
<tr>
<td>b) DLV</td>
<td>£5.55</td>
</tr>
<tr>
<td>c) LXXIII</td>
<td>£2.14</td>
</tr>
<tr>
<td>d) CLXXXII</td>
<td>£5.55</td>
</tr>
<tr>
<td>e) XL</td>
<td></td>
</tr>
<tr>
<td>f) CCXIV</td>
<td>£2.14</td>
</tr>
<tr>
<td>g) MCCXLIV</td>
<td>£11.79</td>
</tr>
<tr>
<td>h) CLXXIX</td>
<td>£1.79</td>
</tr>
</tbody>
</table>

---

### Activity 5

**Arabic to Roman**

Let's write these numbers as Roman numerals. Ps come out to BB to write numerals, explaining reasoning. Class agrees/disagrees.

<table>
<thead>
<tr>
<th>BB</th>
<th>356</th>
<th>204</th>
<th>713</th>
<th>825</th>
<th>1001</th>
<th>968</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCCCLVI</td>
<td>CCI</td>
<td>DCCCXXIII</td>
<td>DCCCCXXXV</td>
<td>MI</td>
<td>CMLXVIII</td>
<td></td>
</tr>
<tr>
<td>179</td>
<td>407</td>
<td>652</td>
<td>936</td>
<td>1053</td>
<td>1104</td>
<td></td>
</tr>
<tr>
<td>CLXXIX</td>
<td>CDVII</td>
<td>DCLII</td>
<td>CMXXXVI</td>
<td>MLIII</td>
<td>MCIV</td>
<td></td>
</tr>
</tbody>
</table>

---

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### Activity

**6 Roman to Arabic**

Let's write these Roman numerals as Arabic numbers. Ps come out to BB to write numbers, explaining reasoning. Class agrees/disagrees.

**BB:**

- a) \(\text{CCCXLVI} = \text{CCC} + \text{XL} + \text{VII} = 300 + 40 + 7 = 347\)
- b) \(\text{DVIII} = \text{D} + \text{VIII} = 500 + 8 = 508\)
- c) \(\text{CD} = \text{D} - \text{C} = 500 - 100 = 400\)
- d) \(\text{MCMXLV} = \text{M} + \text{CM} + \text{XL} + \text{V} = 1000 + 900 + 40 + 5 = 1945\)
- e) \(\text{DCCCLXXXVII} = \text{DCCC} + \text{LXXX} + \text{VII} = 800 + 80 + 8 = 888\)
- f) \(\text{CMX} = \text{CM} + \text{XI} = 900 + 11 = 911\)

**Notes**

- Whole class activity
- Numerals already written on BB or SB or OHP
- At a good pace
- Rest of Ps write in Ex. Bks too.
- Reasoning, agreement, praising
- Feedback for T

---

**7 PbY3a, page 73**

**Q.3** Read: *Write these numbers as Roman numerals.*

T explains task using worked example. Ps first break down Arabic number into hundreds, tens and units, then write Roman numeral below each part, then write complete Roman numeral at the end of the equation.

- Do part a) on BB with whole class if necessary. Rest done as individual work. Review at BB with whole class. Mistakes corrected. Ps explain to class what they did wrong.

**Solution:**

- a) \(756 = (500 + 100 + 100) + 50 + (5 + 1) = DCCLVI\)
- b) \(435 = (500 - 100) + (10 + 10 + 10) + 5 = CDXXXV\)
- c) \(263 = (100 + 100) + (50 + 10) + (1 + 1 + 1) = CCLXIII\)
- d) \(974 = (1000 - 100) + (50 + 10 + 10) + (5 - 1) = CMLXXIV\)

**Notes**

- Individual work, monitored, helped
- Discussion, agreement
- Reasoning, agreement, self-correcting
- Praising, encouragement only

---

**8 PbY3a, page 73**

**Q.4** Read: *Which is more? How many more?*

Write how many more in Roman numerals too!

Elicit that Ps can ignore (or cross off) equivalent values on each side of inequality and only need to compare what is left.

- Do first part with whole class as an example if necessary.
- Review at BB with whole class. Ps come out to BB or dictate to T, explaining reasoning. Class agrees/disagrees.

**Solution:**

- a) \(\text{CLIV} <_{11} \text{CLVI} \quad 154 <_{12}^2 156\)
- b) \(\text{DXXIX} <_{11}^3 \text{DXXXII} \quad 529 <_{13}^3 532\)
- c) \(\text{M} \gg_{11} \text{DCCXX} \quad \text{CCC}L \gg_{11}^{11} \text{CCCXX} \quad 1000 \gg_{11}^{11} 810 \quad 350 \gg_{11}^{11} 320\)

**Notes**

- Individual work, monitored, helped
- Discussion, agreement
- Reasoning, agreement, self-correcting
- Check with Arabic numbers
- Praising, encouragement only

(Or done on BB with whole class)
### Lesson Plan

**Week 15**

#### Activity

<table>
<thead>
<tr>
<th>Week</th>
<th>Activity</th>
<th>Notes</th>
</tr>
</thead>
</table>
| 1    | Equal values | - Whole class activity  
- Drawn on BB or use enlarged copy master or OHP  
- At a good pace  
- Reasoning, agreement, praising  
- Feedback for T |
| 2    | Missing numbers | - Whole class activity  
- Drawn on BB or use enlarged copy master or OHP  
- Reasoning, agreement, praising  
- Most obvious rules are shown but accept any valid rules.  
- **Bold** numbers are given. |
| 3    | Number line | - Whole class activity  
- Use enlarged copy master or OHP  
- Ps have copies of copy master on desks too.  
- At a good pace  
- Ps can write the numbers on their sheets too.  
- Agreement, praising  
- **Solution:**  
  \[ \begin{align*}  
  a &= 7  
  b &= 62  
  c &= 168  
  d &= 462  
  e &= 501  
  f &= 650  
  g &= 700  
  h &= 1005  
  i &= 1243  
\end{align*} \]  
- Praising, encouragement only |
### Activity

#### 4
**Sequence competition**

I will describe a sequence and I will give you 2 minutes to write as many terms as you. Wait until I tell you to start.

The first term of a sequence is 800. Each following term is 17 less than the previous one. Start . . . now! . . . Stop!

Everyone stand up. Ps say terms in order round class. Ps sit down if they are incorrect or get to the end of their terms.

Let’s give the winner ‘3 cheers’!

**Sequence:**

800, 783, 766, 749, 732, 715, 698, 681, 664, 647, 630, 613, 596, 579, 562, 545, 528, 511, 494, 477, 460, 443, 426, 409, . . .

#### Notes

Individual work in *Ex. Bks*, monitored

Keep to time limit

Ps start and stop in unison

If a P is incorrect, next P corrects it. At speed.

Praising

---

#### 5
**PbYY3a, page 74**

- **Q.1 Read:** *Which numbers do the letters stand for?*

  What can you tell me about the number lines? (In a), the ticks show every 10; in b) the ticks show every 20)

  Review at BB with whole class. Ps come out to write in the missing numbers, explaining reasoning. Mistakes corrected.

  **Solution:**

  a) \( a = 50, \ b = 160, \ c = 210, \ d = 270 \)

  b) \( a = 60, \ b = 160, \ c = 340, \ d = 480, \ e = 560 \)

- **Q.2 Read:** *Join up the letters to the matching numbers.*

  Elicit that

  - in the first two number lines, the scale is from 400 to 1000, with ticks at every 10;

  - in the 3rd number line, the scale is from 1400 to 2000, also with ticks at every 10.

  Ps first continue the scale on each number line to make it easier for them.

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

  **Solution:**

  \( a = 460, \ b = 600, \ c = 850, \ d = 972, \ e = 510, \ f = 605, \)

  \( g = 798, \ h = 975, \ i = 1420, \ j = 1600, \ k = 1703 \)

---

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**Y3**

**Activity**

**PbY3a, page 74**

**Q.3** Read: *Which whole numbers make the statement true? Mark them on the number line. Write down the highest and lowest possible numbers.*

Deal with one part at a time. Ps first find 380 and 450 (280 and 380) on number line and mark with vertical lines to help them. Review at BB with whole class. Mistakes corrected.

**Solution:**

a) \[381 \text{ to } 449\]

b) \[280 \text{ to } 380\]

T shows how to mark an inequality on the number line to show all possible numbers (including fractions), not just whole numbers.

a) If the LH (RH) number in an inequality is not a possible number, draw a white circle above it. Then join up the two circles. The line covers all possible numbers, but does not include the number on either side of the inequality.

\[
\begin{array}{c}
0 & 100 & 200 & 300 & 400 & 500 & 600 \\
\underbrace{380 \text{ < }} & \text{white circle} & < & \underbrace{450} \\
\end{array}
\]

b) If the LH (RH) number in an inequality is a possible number, draw a black circle above it. Then join up the two dots. The line covers all possible numbers, including the numbers on either side of the inequality.

\[
\begin{array}{c}
0 & 100 & 200 & 300 & 400 & 500 & 600 \\
\underbrace{280 \text{ ≤ }} & \text{black circle} & \leq & \underbrace{380} \\
\end{array}
\]

**Extension**

**PbY3a, page 74**

**Q.4** Read: *Continue the sequences.*

Think what the rules could be. Write as many terms as you can in the space provided. Write the rule at the end of each line (or in the margin). Deal with one part at a time. Review with whole class. Ps say their terms and give the rule. Who agrees? Who used a different rule? etc.

**Solution:**

a) 1, 2, 4, 8, 16, (32, 64, 128, 256, 512, 1024, 2048, . . .)

**Rule:** Each following term is \(2 \times\) the previous term

b) 1, 4, 9, 16, 25, (36, 49, 64, 81, 100, 121, 144, 169, 196, 225, 256, 289, . . .)

**Rule:** The difference between one term and the next is increasing by 2 (or \(1 \times 1\), \(2 \times 2\), \(3 \times 3\), \(4 \times 4\), etc.)

c) 0, 1, 1, 2, 3, 5, 8, (13, 21, 34, 55, 89, 144, 233, 377, 610, . . .)

**Rule:** Each term is the sum of the 2 previous terms.

d) 1, 3, 6, 10, 15, (21, 28, 36, 45, 55, 66, 78, 91, 105, 120, . . .)

**Rule:** The difference between one term and the next is increasing by 1.

**Lesson Plan 74**

**Notes**

Individual trial, monitored helped

Drawn on BB or use enlarged copy master or OHP

(If majority of Ps are struggling, change to whole class activity)

Discussion, reasoning, agreement, self correction, praising

Explanation, demonstration

Consolidate by Ps marking another similar inequality.

\(10 < \text{white circle} < 100\)

and \(520 \leq \text{black circle} \leq 600\)

**Week 15**

Individual work, monitored, helped

Differentiation by time limit

Discussion, reasoning, agreement, praising

Accept any valid rule

If Ps do not know the rule, T explains.

For T:

a) geometric sequence: \(a_n = 2^{n-1}, n = 1, 2, 3, ...\)

b) Square numbers: \(a_n = n^2, n = 1, 2, 3, ...\)

c) Fibonacci sequence

d) \(a_n = \frac{n(n + 1)}{2}\)
<table>
<thead>
<tr>
<th>Activity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practice, revision, activities, consolidation &lt;br&gt; <em>PbY3a, page 75</em></td>
<td></td>
</tr>
</tbody>
</table>
## Lesson Plan

### Activity

<table>
<thead>
<tr>
<th>Y3</th>
<th>R: Mental calculation</th>
<th>C: Rounding to tens and hundreds</th>
<th>E: Numbers up to 2000</th>
</tr>
</thead>
</table>

### Notes

**Week 16**

**Lesson Plan 76**

**Notes**

- Whole class activity
- Paired work in finding the numbers
- Encourage logical order.

Agreement, praising

- Ps have probability flash cards on desks (Y2 LP 154/2)
- or use pre-agreed actions for each response.

Cards shown in unison

Reasoning, agreement, praising

(Demonstrate with cards in a bag only if there are problems)

---

1. **Making 3-digit numbers**
   
   Let's see how many different 3-digit numbers you can make from these number cards:
   
   BB: 8 6 3
   
   Ps have the 3 number cards on their desks and manipulate to make different 3-digit numbers which they write in their Ex. Bks.
   
   Review quickly at BB with whole class. Ps dictate what T should write.
   
   BB: 863 683 386
   836 638 368
   
   Imagine that I wrote each of these 3-digit numbers on the same size of card and put them all into a bag. If I took out one card with my eyes shut, which of these statements would be certain, possible but not certain, or impossible?
   
   a) The number is greater than 800. Show me . . . now! (Possible)
   b) The number is greater than 300. Show me . . . now! (Certain)
   c) The number is less than 200. Show me . . . now! (Impossible)
   d) The number is less than 500. Show me . . . now! (Possible)
   
   **7 min**

2. **Rounding**
   
   a) What are the nearest whole tens less than and greater than each of these numbers? Ps come out to BB. Class points out errors.
   
   BB: 860 < 863 < 870 680 < 683 < 690 380 < 386 < 390
   830 < 836 < 840 630 < 638 < 640 360 < 368 < 370
   
   Which whole ten is nearest the middle number? Ps come out to underline. Class agrees/disagrees. Show on number line if problems.
   
   We say that the nearest whole ten to a number is that number rounded to the nearest ten.
   
   I will say a number and you round it to the nearest whole ten, e.g. 354 (= 350, to the nearest 10), 687 (= 690, to the nearest 10), 670 (= 670, to the nearest 10), 635 (= 640, to the nearest 10).
   
   Discuss the case of 635, where 5 units is half-way between tens.
   
   T tells class that in such cases, the number is rounded up to next ten.
   
   b) What are the nearest whole hundreds less than and greater than each of these numbers? Ps come out to BB. Class points out errors.
   
   BB: 800 < 863 < 900 600 < 683 < 700 300 < 386 < 400
   800 < 836 < 900 600 < 638 < 700 300 < 368 < 400
   
   Which hundred is nearest the middle number? Ps come out to underline. Class agrees/disagrees. Show on number line if problems.
   
   We say that the nearest hundred to a number is that number rounded to the nearest hundred.
   
   I will say a number and you round it to the nearest hundred, e.g. 456 (= 500, to the nearest 100), 612 (= 600, to the nearest 100), 500 (= 500, to the nearest 100), 249 (= 200, to the nearest 100).
   
   How do you think we would round 350 to the nearest hundred?
   
   Agreement that such numbers are rounded up to the nearest hundred.

   **15 min**
**Y3**

### Activity 3

#### Number line

a) Let's find the approximate place of these numbers on the number line.

**BB:** i) 542, 545, 548  
   ii) 645, 647, 652, 655

Elicit that the segment of number line needed is from 500 to 700.

T draws number line on BB and Ps draw it in their Ex. Bks.

Ps then mark the numbers with dots on the number line and label them (numbers can be written above the number line and joined to the dots, as they are too close together to label in exact position.)

**BB:**

- 500 < 542 < 600
- 500 < 545 < 600
- 500 < 548 < 600
- 500 < 645 < 700
- 600 < 647 < 700
- 600 < 652 < 700
- 600 < 655 < 700

b) Write the nearest whole tens and hundreds less than and greater than each number as we did before, then underline the nearest ten and nearest hundred.

Review at BB with whole class. Mistakes corrected.

**BB:**

i) 540 < 542 < 550  540 < 545 < 550  540 < 548 < 550
   500 < 542 < 600

ii) 640 < 645 < 650  640 < 647 < 650  650 < 652 < 660
   600 < 645 < 700
   600 < 647 < 700
   600 < 652 < 700
   650 < 655 < 660
   600 < 655 < 700

**c)** What is each number rounded to the nearest ten (hundred)? T points to each number in turn and chooses Ps to round to nearest ten (hundred).

Class agrees/disagrees.

e.g. i) 542 ≈ 540, to nearest 10;  542 ≈ 500, to nearest 100

Discuss the case of, e.g. 545, which is rounded up to 550 to the nearest whole ten, but is rounded down to 500 to the nearest hundred.

25 min

### PbY3a, page 76

Q.1 Read: *List the whole numbers which have these numbers as their nearest whole ten.*

Review orally with whole class. Ps read their numbers and class agrees/disagrees. Ps also show numbers on number line. Mistakes corrected. T elicits any numbers Ps have missed, e.g. 55, 95, etc.)

**Solution:**

a) 60: 55, 56, 57, 58, 59, 60, 61, 62, 63, 64
b) 100: 95, 96, 97, 98, 99, 100, 101, 102, 103, 104
c) 580: 575, 576, 577, 578, 579, 580, 581, 582, 583, 584
d) 1500: 1495, 1496, 1497, 1498, 1499, 1500, 1501, 1502, 1503, 1504
e) 0: (-4, -3, -2, -1), 0, 1, 2, 3, 4

Show on negative class number line. Point out that – 5 is rounded down to – 10, to the nearest whole ten.

30 min

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### Lesson Plan 76

<table>
<thead>
<tr>
<th>Activity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5</strong></td>
<td></td>
</tr>
<tr>
<td><strong>PbY3a, page 76</strong></td>
<td>Individual work, monitored, helped</td>
</tr>
</tbody>
</table>
| Q.2 Read: **Mark on the number line the numbers which have these numbers as their nearest whole hundred:** a) 500, b) 1000.  
What is different about this question? (Asks for numbers, not whole numbers, so fractions can be included.) What will happen if we draw a dot at every possible number and fraction? (They will all join together to form a line.)  
Who remembers how we can show all possible numbers, including fractions? (Write an inequality, draw circles at the lowest and greatest numbers, then join circles with a thick line.)*  
T reminds Ps about drawing a black circle if the number is to be included in the list of possible numbers and a white circle if not. (Do part a) with whole class first if Ps have forgotten.  
Review at BB with whole class. Mistakes corrected.  
**Solution:**  
a) ![Number line](image)
b) ![Number line](image) | (or whole class activity if T thinks it is necessary) |
| **6**    |       |
| **PbY3a, page 76** | Number lines drawn on BB or use enlarged copy master or OHP |
| Q.3 Read: **Decide whether the quantities in the answers are exact or approximate. Write = or ≈ in the boxes.**  
T chooses Ps to read out each part, then Ps write appropriate sign in box. Review orally with whole class. Ps who answered correctly explain to those who did not. Discuss all mistakes.  
Consolidate with similar examples if necessary.  
a) *The shop assistant said, 'It is £400.' (=)*  
b) *The policeman said, 'It is 400 metres further on.' (≈)*  
(He did not measure exactly so he meant 'about 400 m'.)  
c) *Her mother said, 'There must be 100 buttons in the box.' (=)*  
(Unless Cindy's mother had emptied out the buttons and counted them all exactly.)  
d) *The storeman said, 'There are 150 screws in a packet.' (= or ≈, depending on whether the screws had been counted by the storeman, or by machine and the number printed on the packet, or whether the screws were sold by weight, so the number might vary slightly)* | Give Ps the chance to explain if they can, otherwise T revises the notation. |
| **7**    |       |
| **PbY3a, page 76** | Discussion, reasoning, agreement, self-correction, praising |
| Q.4 Read: **Round these numbers to the nearest:**  
a) ten, b) hundred.  
Remind Ps that to decide on the nearest:  
• ten, they should look at the **units** (5 rounds **up** to next 10)  
• hundred they should look at the **tens** (50 rounds **up** to next 100)  
Review orally round class. Mistakes corrected. Show on number line if there are problems. | Give Ps the chance to explain why both answers could be possible, otherwise T explains. |
### Activity

#### 1 Number line
Let’s join up these numbers to the corresponding points on the number line. Ps come out to choose a number, draw a dot and join to number. Agree that some dots can only be in an approximate position, as the 'ticks' show only every 10.

BB: 

```
340  403  481  578  610  20
```

Not shown!

#### 2 Rounding 1
Let’s round these numbers to the nearest 10 and then to the nearest 100.

BB: 

<table>
<thead>
<tr>
<th>Number</th>
<th>Rounded to nearest 10</th>
<th>Rounded to nearest 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>349</td>
<td>350</td>
<td>300</td>
</tr>
<tr>
<td>403</td>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td>481</td>
<td>480</td>
<td>500</td>
</tr>
<tr>
<td>578</td>
<td>580</td>
<td>600</td>
</tr>
<tr>
<td>610</td>
<td>610</td>
<td>600</td>
</tr>
<tr>
<td>310</td>
<td>310</td>
<td>300</td>
</tr>
<tr>
<td>450</td>
<td>450</td>
<td>500</td>
</tr>
<tr>
<td>600</td>
<td>600</td>
<td>600</td>
</tr>
<tr>
<td>742</td>
<td>740</td>
<td>700</td>
</tr>
</tbody>
</table>

(Ps come out to choose a number and fill in the appropriate columns, but note that 350 = 400, to the nearest 100)

Ps come out to choose a number which could be rounded up to 350 to the nearest 10, but rounded down to 300 to the nearest 100.

#### 3 Rounding 2
Let’s help Donald Duck with his homework.

a) First he had to underline those numbers which could be rounded to 620 to the nearest 10, but he can’t do it. Who can help him?

BB: 148, 615, 624, 625, 610, 622, 617, 628

Ps come out to underline the relevant numbers. Class agrees/disagrees. What would the other numbers be, rounded to the nearest 10?

b) Then he had to underline those numbers which could be rounded to 500 to the nearest 100. Who can help him this time?

BB: 348, 545, 470, 451, 551, 567, 612, 440, 490

Ps come out to underline the relevant numbers. Class agrees/disagrees. What would the other numbers be rounded to the nearest 100?
### Activity

#### 4 Number line

Let's see if you can mark these numbers on the number lines.

**a)** Whole numbers which can be rounded to 270 to the nearest 10.

Ps come out to draw dots at the possible numbers. Class agrees/disagrees. (265 to 274)

If I had asked for all possible numbers, including fractions, how could we write it in a mathematical way? A, what do you think? Who agrees? Who thinks something else? etc.

How could we show it on the number line? Teacher gives hints if necessary. Ps come out to number line to draw a closed (black) circle at 265 and an open (white) circle at 275, then to join them with a thick line. Let's say the inequality together.

BB:

\[ 265 \leq x < 275 \]

**b)** Whole tens which can be rounded to 800 to the nearest 100.

Repeat as in a) but drawing dots first at numbers 750 to 840, then extending to all possible numbers.

BB:

\[ 750 \leq x < 850 \]

#### 5 Oral practice

Tell me the even numbers which can be rounded to:

**a)** 1000 to the nearest 10. (996, 998, 1000, 1002, 1004)

**b)** 1000 to the nearest 100 and have 1 as the tens digit.

(1010, 1012, 1014, 1016, 1018)

**c)** 1000 to the nearest 10 and have 1 as the tens digit.

(Impossible – possible even numbers which round to 1000 to the nearest 10 are 996 to 1004 and none have 1 as the tens digit!)

**d)** 1000 to the nearest 10 and have 1 as the units digit.

(Impossible – a whole number which has 1' as its units digit is odd!)

The whole class activity

T chooses Ps at random (or Ps write in Ex. Bks. if they wish)

Reasoning, agreement, praising only

Check on number line if there are problems.

Feedback for T

In good humour!

#### 6 PY3a, page 77

**Q.1** Read: *List the whole numbers which*

- **a)** round to 500 as the nearest hundred and have 5 as the tens digit.
- **b)** round to 500 as the nearest hundred and have 4 as the tens digit.
- **c)** round to 500 as the nearest hundred and also as the nearest ten.

Review at BB with whole class. Mistakes discussed and corrected.

Show on number line as confirmation.

**Solution:**

**a)** 450, 451, 452, 453, 454, 455, 456, 457, 458, 459

**b)** 540, 541, 542, 543, 544, 545, 546, 547, 548, 549

**c)** 495, 496, 497, 498, 499, 500, 501, 502, 503, 504

The whole class activity

Ps may use number line on page 76, Q.2a to help them.

Discussion at BB, reasoning, agreement, self-correction, praising

Feedback for T

In good humour!
**Lesson Plan 77**

### Y3

**Activity**

<table>
<thead>
<tr>
<th>7</th>
<th>PBY3a, page 77</th>
</tr>
</thead>
</table>
| Q.2 | Read: Which digits can the letters represent so that if the numbers are rounded to
  a) the nearest ten, the value is 360,  
  b) the nearest hundred, the value is 400? |
| | Review at BB with whole class. T chooses Ps to give their results and class agrees/disagrees or adds any numbers omitted. Mistakes discussed and corrected. Show on number line. |
| **Solution:** |  |
| a) | ![56](56) ![64](64) ![3](3) ![5](5) ![3](3) ![35](35) ![36](36) |
| 3 | 3 | 5 | 6 | 5, 6, 7, 8, 9 | 0, 1, 2, 3, 4 |
| b) | ![2](2) ![50](50) ![49](49) ![3](3) ![1](1) ![4](4) ![9](9) ![35](35) ![44](44) |
| 3 | 4 | 5, 6, 7, 8, 9 | 0, 1, 2, 3, 4 | 0, 1, 2, 3, 4 | 0, 1, 2, 3, 4, |
| 5, 6, 7, 8, 9 | 5, 6, 7, 8, 9 |
| 35 min |  |

<table>
<thead>
<tr>
<th>8</th>
<th>PBY3a, page 77</th>
</tr>
</thead>
</table>
| Q.3 | Read: Round these numbers to:
  a) the nearest ten  
  b) the nearest hundred. |
| | Let's see how many you can do in 3 minutes!
| | Start . . . now! . . . Stop!
| | Review at BB with whole class. Ps change pencils and mark/correct own work. Who had them all correct? Who had 1 mistake (2, 3, 4, 5, more than 5 mistakes)? What were your mistakes? etc. If problems, show on number line. |
| **Solution:** | a) to nearest 10  b) to nearest 100 |
| | 1006 = 1010 1006 = 1000 |
| | 1005 = 1010 1005 = 1000 |
| | 1001 = 1000 1001 = 1000 |
| | 1753 = 1750 1753 = 1800 |
| | 1759 = 1760 1759 = 1800 |
| | 1750 = 1750 1750 = 1800 |
| 40 min |  |

<table>
<thead>
<tr>
<th>9</th>
<th>PBY3a, page 77, Q.4</th>
</tr>
</thead>
</table>
| Read: Two different numbers round to 300 as the nearest hundred. Is it possible that:
  a) both numbers are less than 300? Show me . . . now! (Yes)
  B, which numbers could they be? (e.g. 267, 276)  
  b) the smaller number is 100 less than the other number? Show me . . . now! (No) C, explain to us why it is impossible. (The smallest possible number is 250 and the possible greatest number is 349, so the greatest difference is 99.)  
  c) one number has 5 and the other has 0 as the tens digits? Show me . . . now! (Yes)
  D, which numbers could they be? (e.g. 256 and 301)  
  d) both numbers are whole hundreds? Show me . . . now! (No) E, why is it not possible? (There is only one possible whole hundred and that is 300.) |
| | Individual work, monitored, helped
| | Written on BB or use enlarged copy master or OHP
| | T draws relevant segments of number line on BB
| | (Ps may draw number lines in Ex. Bks to help them if needed)
| | Discussion, reasoning, agreement, self-correction, praising |
| | Whole class activity
| | (or individual work if Ps wish)
| | Ps could use probability cards from Y3 LP 154.2, or respond with pre-agreed actions for 'Yes' and 'No'
| | Ps who responded correctly explain to those who did not, reasoning with examples or counter examples.
| | Agreement, praising only
| | Feedback for T |

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### Y3

#### Activity 1

**Measuring with a ruler**

Ps have 10 cm rulers and the same things of different sizes on desks (e.g. a stamp, a cocktail stick, a rectangle cut from card, etc.)

What does each large ‘tick’ on the ruler show? (cm) Let’s measure, e.g., the cocktail stick.

- How can we write the measurement using just whole cm?
  Ps suggest what T should write or come to BB themselves:
  BB: e.g. 3 cm < length of stick < 4 cm

- How could we be more accurate? (e.g. use half cm) Ps suggest what T should write or come to BB:
  BB: e.g. 3 cm < length of stick < 3 and a half cm

- How could we be even more accurate? (use mm) How many mm are in one cm? (10 mm) Ps confirm by counting the number of small ticks between cm on the ruler. Who can come and write the length using cm and mm? Who agrees? etc.
  BB: e.g. length of stick = 3 cm 4 mm

Ps measure the other objects using cm and mm and write measurements in Ex. Bks. Review quickly with whole class.

Revise and compare the standard units of length. T has a metre rule to show and, if possible, Ps each have a 1 m long strip of paper or card.

BB: **Standard Units of Length**

<table>
<thead>
<tr>
<th>unit</th>
<th>abbreviation</th>
<th>relationship</th>
</tr>
</thead>
<tbody>
<tr>
<td>metre (m)</td>
<td>centimetre (cm)</td>
<td>millimetre (mm)</td>
</tr>
<tr>
<td>1 m</td>
<td>100 cm</td>
<td>1000 mm</td>
</tr>
<tr>
<td>1 cm</td>
<td>1 hundredth of a metre</td>
<td>10 mm</td>
</tr>
<tr>
<td>1 mm</td>
<td>1 thousandth of a metre</td>
<td>1 tenth of a cm</td>
</tr>
</tbody>
</table>

T underlines relevant Latin derivatives and elicits (or tells) that ‘centi’ means ‘1 hundredth’ and ‘milli’ means ‘1 thousandth’.

**10 min**

**2 Ordering lengths**

Let’s put these quantities in increasing order.

BB: 3 m, 300 mm, 40 cm, 20 mm, half a metre, 50 mm

How could we do it? (Change them all to the same unit.) Which unit shall we use? (e.g. mm). Ps come to BB to write value in mm below the lengths given in other units, then to write again in increasing order.

BB: 20 mm < 50 mm < 300 mm < 40 cm < half a metre < 3 m

(400 mm) (500 mm) (3000 mm)

What other unit could we have used? (e.g. cm) Who could write out the lengths in increasing order as cm?

BB: 2 cm < 5 cm < 30 cm < 40 cm < 50 cm < 300 cm

T chooses Ps to come to front of class to demonstrate the actual lengths.

**15 min**

### Lesson Plan

**Week 16**

- **R:** Numbers up to 1000
- **C:** Measuring length in cm and mm
- **E:** Numbers up to 2000. Decimal notation.

#### Notes

Whole class activity
(Or any small objects which are not an exact number of cm long)

Individual work in measuring

Agreement, praising

**Individual work in measuring and recording**

Whole class discussion on units of measure and their relationship to one another.

Involve several Ps. Ps tell class what they know.

T could talk about the old language used by the ancient Romans: **Latin**, from which some of our own words come.

**Whole class activity**

Written on BB (or on cards stuck to BB for Ps to manipulate)

Discussion, reasoning, agreement, praising

At a good pace

(Or as cm first, then as mm, depending on Ps’ choice)

Using rulers, metre rules, tape measure, etc.

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### Activity 3

**PbY3a, page 78, Q.1**

These are the routes taken by Lambkin's friends when they go to visit him. Who could they be? (e.g. Duck, Bunny, Goat and Hedgehog)

I wonder who had furthest to travel to visit Lambkin?

Read: *Estimate the length of the routes in the drawings first, then measure them.*

How long are the routes really if 1 cm in the drawing means 10 m in real life?

Deal with one route at a time. Ps write own estimate in *Pbs.* T reviews them orally. Let's see who is most accurate!

How can we measure the route if we can't bend our ruler? (Measure the length of each straight part and then add up the lengths)

Ps measure in mm first and write lengths above (below, beside) the lines and then add them up and write total length as mm in *Pbs.*

How can we change the mm to cm? (Divide by 10) Ps write total length as cm in *Pbs.* Review at BB with whole class. Establish whose estimate was closest.

If 1 cm in the diagram is really 10 metres in real life, how can we work out how far Duck had to walk to see Lambkin? (multiply by 10 and change the unit to metres)

Repeat for other parts. Review with whole class. Mistakes corrected.

**Solution:**

a) D to L: Length: 10 mm + 10 mm + 30 mm = 50 mm = 5 cm  
   Length in real life: 5 cm → 50 m

b) B to L: Length: 20 mm + 10 mm + 35 mm = 65 mm  
   = 6 and a half cm
   Length in real life: 6 and a half cm → 65 m

c) G to L: Length: 45 mm = 4 and a half cm
   Length in real life: 4 and a half cm → 45 m

d) H to L: Length: 20 mm + 15 mm + 10 mm + 5 mm + 20 mm  
   = 70 mm = 7 cm
   Length in real life: 7 cm → 70 m

Elicit that Hedgehog had to travel the furthest.

What do you notice? Elicit (or point out if nobody notices) that the number of metres in real life is the same as the number of mm in the diagrams, so the scale could also be written in another way. (BB)

In parts b) and c), the diagram lengths were 65 mm and 45 mm. Instead of saying 6 and a half cm, we can write it as 6.5 cm. (BB)

We read it as 'six point five centimetres'. Does anyone know what it means? T explains if nobody knows. (6 whole cm and 5 tenths of a cm)

Who can write 45 mm in the same way? Who can read it? Who can tell us what it means?

Any number written in this way is called a **decimal**. The dot is called the **decimal point**.

How could we show these two decimals in the place value table? Ps suggest to T what to write.

---

### Notes

Whole class activity but measuring and calculating as individual work

Initial discussion about context for problem as motivation

Routes drawn on BB or use enlarged copy master or OHP for demonstration only!

If necessary, T revises how to measure accurately with a ruler.

Discussion, reasoning, self-correction, praising

**BB:** Scale: 1 cm → 10 m  
so D to L: 5 cm → 50 m

Individual work, monitored, helped  
(or continue as whole class activity if Ps do not understand)

Discussion, agreement, praising if a P notices

**BB:** Scale: 1 mm → 1 m

Some Ps might already know about decimals in the context of money.

**BB:** 65 mm = 6.5 cm  
45 mm = 4.5 cm

**Decimal decimal point**

**BB:**

<table>
<thead>
<tr>
<th>Tens</th>
<th>Units</th>
<th>Tenths</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>
### Y3

#### Activity

4

**Writing lengths in different ways**

Who can think of another way to write these measurements? Elicit relationship between units. (BB) Ps come to BB to write each length in a different way. Class agrees/disagrees or suggests another way.

BB:

- a) 3 cm = (30 mm)
- b) 4 m = (400 cm)
- c) 18 cm = (180 mm)
- d) 13 m = (1300 cm)
- e) 35 mm = (3 cm 5 mm = 3.5 cm)
- f) 300 cm = (3 m)
- g) 135 mm = (13 cm 5 mm = 13.5 cm)
- h) 450 cm = (4 m 50 cm = 4.5 m) Elicit that 50 cm is 5 tenths of a m.

#### Notes

- Whole class activity
- Written on BB or OHT
- Discussion, agreement
- BB: 1 cm = 10 mm
  - 1 m = 100 cm
  - 1 m = 1000 mm
- At a good pace
- Reasoning, agreement, praising
- Extra praise if Ps write as decimals without help from T

5

**PbY3a, page 78**

Q.2 Read: *Write these lengths in millimetres.*

Deal with one part at a time. Review at BB with whole class. Mistakes corrected. Tick the lengths which are more than 1 m.

**Solution:**

- a) 2 cm = 20 mm, 11 cm = 110 mm, 105 cm = 1050 mm
- b) 5 cm = 50 mm, 20 cm = 200 mm, 132 cm = 1320 mm
- c) 9 and a half cm = 95 mm, 57 and a half cm = 575 mm, 123 and a half cm = 1235 mm

T (or class) chooses Ps to show the approximate lengths. Class decides whether they are good estimates. Confirm with rulers or metre rule or measuring tape.

#### Notes

- Individual work, monitored, helped
- Written on BB or OHT
- Reasoning, agreement, self-correction, praising
- Whole class activity
- Praising, encouragement only
- In good humour!

6

**PbY3a, page 78**

Q.3 Read: *Change the units of length.*

Deal with one part at a time. Review at BB with whole class. All mistakes discussed and corrected.

**Solution:**

- a) 25 mm = 2 cm 5 mm
- b) 2 m = 200 cm 0 mm
- 125 mm = 12 cm 5 mm
- 82 mm = 8 cm 2 mm
- 12 m = 1200 cm
- 123 mm = 12 cm 3 mm
- 382 mm = 38 cm 2 mm
- 642 cm = 6 m 42 cm

How could we show, e.g. 25 mm, using only cm as the unit? BB: 2 cm < 25 mm < 3 cm or

- 25 mm = 2.5 cm (2 whole cm and 5 tenths of a cm)

Repeat in similar way for other lengths. Ps come out to BB to write and explain reasoning (with T's help if necessary).

#### Notes

- Individual work, monitored, helped
- Written on BB or SB or OHT
- Reasoning, agreement, self-correction, praising
- Whole class activity
- Reasoning, agreement
- Praising, encouragement only
- e.g. 6 m < 642 cm < 7 m
  - 642 cm = 6.42 m
  - (6 whole metres and 42 hundredths of a metre)
### Lesson Plan 78

#### Activity 7

**Rounding lengths**

a) How can we round 423 mm to the nearest cm? T shows one method (with help of Ps). Elicit that:

\[
\text{BB: } 423 \text{ mm} = 42 \text{ cm} \, 3 \text{ mm} \quad [1 \text{ cm} = 10 \text{ mm}]
\]

and that 42 cm 3 mm is more than 42 cm and less than 43 cm.

\[
\text{BB: } \frac{42 \text{ cm}}{+ \, 3 \text{ mm}} < \frac{42 \text{ cm} \, 3 \text{ mm}}{+ \, 7 \text{ mm}} < \frac{43 \text{ cm}}{}
\]

Which is it nearer? (42 cm) So we can say that 42 cm 3 mm, or 423 mm, is approximately equal to 42 cm. How could we write it?

\[
\text{BB: } 423 \text{ mm} \approx 42 \text{ cm}, \text{ to the nearest cm}
\]

Repeat in similar way for 305 mm and 997 mm, with Ps coming out to BB to write and explain, with help of T and other Ps.

b) BB: 305 mm = 30 cm 5 mm, 30 cm < 30 cm 5 mm < \frac{31 \text{ cm}}{+ \, 5 \text{ mm}} \, 5 \text{ mm}

\[
305 \text{ mm} \approx 31 \text{ cm}, \text{ to nearest cm}
\]

c) BB: 997 mm = 99 cm 7 mm, 99 cm < 99 cm 7 mm < \frac{100 \text{ cm}}{+ \, 7 \text{ mm}} \, 3 \text{ mm}

\[
997 \text{ mm} \approx 100 \text{ cm}, \text{ to nearest cm}
\]

What would happen if we used decimal notation? Elicit that:

a) BB: 423 mm = 42.3 cm (42 whole cm and 3 tenths of a cm)

and 42.3 cm is nearer 42 cm than 43 cm, so

\[
\text{BB: } 42.3 \text{ cm} = 42 \text{ cm}, \text{ to nearest cm}
\]

b) 305 mm = 30.5 cm, so 30.5 cm = \frac{31 \text{ cm}}{+ \, 5 \text{ mm}} \, 5 \text{ cm}, \text{ to nearest cm}

c) 997 mm = 99.7 cm, so 99.7 cm = \frac{100 \text{ cm}}{+ \, 3 \text{ mm}} \, 3 \text{ cm}

---

#### Extension

What would happen if we used decimal notation? Elicit that:

a) BB: 423 mm = 42.3 cm (42 whole cm and 3 tenths of a cm)

and 42.3 cm is nearer 42 cm than 43 cm, so

\[
\text{BB: } 42.3 \text{ cm} = 42 \text{ cm}, \text{ to nearest cm}
\]

b) 305 mm = 30.5 cm, so 30.5 cm = \frac{31 \text{ cm}}{+ \, 5 \text{ mm}} \, 5 \text{ cm}, \text{ to nearest cm}

c) 997 mm = 99.7 cm, so 99.7 cm = \frac{100 \text{ cm}}{+ \, 3 \text{ mm}} \, 3 \text{ cm}

---

### Notes

Whole class activity

T leads Ps through method by asking questions and writing each step on the BB

Reasoning, agreement, praising

Elicit that 5 always rounds up to next value

Reasoning, agreement, praising

If T thinks Ps have understood, part c) could be done as individual work in Ex. Bks, reviewed with whole class.
Lesson Plan 79

Y3

Activity

1. Comparing lengths
Which is more? How much more? T asks several Ps what they think and why. T helps and corrects them and emphasises important points.
T helps Ps to change the units to cm and to show the decimals in a place-value table. (Draw on BB or use enlarged copy master.)
BB:

1. a) 3 m 25 cm \(=\) 3.25 m (3 m \(<\) 3.25 m \(<\) 4 m)
2. b) 4.15 m \(<\) 5 m (4 m \(<\) 4.15 m \(<\) 5 m)
3. c) 5.55 m \(=\) 5 m 55 cm (5 m \(<\) 5.55 m \(<\) 6 m)
4. d) 7 m \(>\) 6.45 m (6 m \(<\) 6.45 m \(<\) 7 m)

2. Missing numbers
What do you think the 2 m has to do with the additions? (Each pair of values adds up to 2 m.) Ps come out to change units where necessary, do calculation and fill in the missing numbers, explaining reasoning.
Class checks that they are correct.
BB: 2 m (2 m = 200 cm)
100 cm + 100 cm Check:
1.25 m + 75 cm (125 cm + 75 cm = 200 cm)
1.58 m + 42 cm (158 cm + 42 cm = 200 cm)
1.85 m + 15 cm (185 cm + 15 cm = 200 cm)

3. Secret number
I am thinking of a number. Try to find out what it is by asking me questions but I can answer only 'Yes' or 'No'. e.g. 500:
e.g. Does it have 3 digits? (Yes) Is it more than 500? (No) Is it less than 400? (No) Is it an odd number? (No) Is it more than 450? (Yes) Is it less than 480? (No) Does it have 2 digits the same? (Yes) Is its units digit zero? (Yes) It is 500! (Yes)

4. Equal values
Let's jont up the equal values.
Ps come to BB to join up, explaining reasoning. Class agrees/disagrees.
Which lengths could be written another way?

Notes

Whole class activity
Written on BB or SB or OHT
T has no expectations, but waits to hear what Ps have to say.
BB: Place value table

<table>
<thead>
<tr>
<th>H</th>
<th>T</th>
<th>U</th>
<th>t</th>
<th>h</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>b)</td>
<td>4</td>
<td>1</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>c)</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>d)</td>
<td>6</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

H = Hundreds, T = Tens, U = Units, t = tenths, h = hundredths
1 cm = 1 hundredth of a m
10 cm = 1 tenth of a m
Praise all contributions

Whole class activity
Written on BB or use enlarged copy master or OHP
Agree that missing value can be found by subtracting given value from 200 cm, e.g.
200 cm – 125 cm = 75 cm
Reasoning, checking, agreement, praising
Feedback for T

Whole class activity
Encourage Ps to keep in mind clues already given and to ask logical questions.
T reminds Ps of important clues if necessary
Extra praise for creativity

Whole class activity
Written on BB or use enlarged copy master or OHP
Reasoning, agreement, praising
e.g. 147 cm = 1 m 47 cm

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Comparing jumps

Ant, Butterfly, Cricket and Dragonfly are having a jumping competition. These were the lengths of their jumps.

BB:  
A: 150 cm,  B: 120 cm,  C: 183 cm,  D: 95 cm

Let's compare their jumps and put them in decreasing order. T writes what Ps dictate. Who was the winner? (Cricket)

BB: 183 cm > 150 cm > 120 cm > 95 cm

Who could write their jumps in metres? Ps come out to BB to write jumps in metres, explaining reasoning. Class agrees/disagrees.

BB: 1.83 m > 1.5 m > 1.2 m > 0.95 m

Whose jump is less than 1 metre? (Dragonfly’s)

Elicit that: 1.83 m = 1 whole metre and 83 hundredths of a metre
1.5 m = 1 whole metre and 5 tenths of a metre
1.2 m = 1 whole metre and 2 tenths of a metre
0.95 m = no whole metres and 95 hundredths of a metre

Estimation

Let's estimate the lengths of some objects and then check how close we are by measuring exactly. (Ps suggest things to measure.)
(e.g. a pencil, a book, the width and height of a desk, etc.)

PhY3a, page 79

Q.1 Read: Round these lengths to:
   a) the nearest 10 mm,  b) the nearest 100 mm.

Review orally round class. Mistakes corrected.

Let's round the lengths to the nearest cm!

T says lengths in mm and Ps round it to nearest cm, explaining reasoning. Class points out errors.

Solution:

a) to nearest 10 mm (cm)  b) to nearest 100 mm

184 mm ≈ 180 mm (18 cm)  184 mm ≈ 200 mm
687 mm ≈ 690 mm (69 cm)  687 mm ≈ 700 mm
185 mm ≈ 190 mm (19 cm)  185 mm ≈ 200 mm
205 mm ≈ 210 mm (21 cm)  205 mm ≈ 200 mm
100 mm = 100 mm (10 cm)  100 mm = 100 mm
372 mm ≈ 370 mm (37 cm)  372 mm ≈ 400 mm

What would the actual lengths be in cm? (e.g. 184 mm = 18.4 cm).
### Lesson Plan 79

**Activity**

<table>
<thead>
<tr>
<th>8</th>
<th><strong>PbY3a, page 79</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Q.2</td>
<td>Read: <em>The length of a line is about 12 cm, rounded to the nearest cm. How long could the actual length of the line be? Draw 4 possible lines accurately. Write the actual length below each line.</em></td>
</tr>
<tr>
<td></td>
<td>What is the shortest possible length the line could be? (11.5 cm or 115 mm or 11 cm 5 mm)</td>
</tr>
<tr>
<td></td>
<td>What is the longest possible length the line could be? (It must be just less than 12.5 cm (or 125 mm or 12 cm 5 mm) as 12.5 cm rounds up to 13 cm, to the nearest cm)</td>
</tr>
<tr>
<td></td>
<td>Ps draw 4 lines and write their lengths in any way they wish. Ps exchange <em>Pbs</em> with neighbours who check measurements are accurate.</td>
</tr>
<tr>
<td></td>
<td>Review orally with whole class. T asks one or two Ps for their measurements. Class decides whether they are possible.</td>
</tr>
</tbody>
</table>

| 36 min |

<table>
<thead>
<tr>
<th>9</th>
<th><strong>PbY3a, page 79</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Q.3 a)</td>
<td>Read: <em>Write these length in millimetres.</em> Deal with one part at a time. Review orally round class. Mistakes corrected.</td>
</tr>
<tr>
<td></td>
<td>Solution:</td>
</tr>
<tr>
<td>i)</td>
<td>12 cm = 120 mm ii) 3 cm 3 mm = 33 mm</td>
</tr>
<tr>
<td></td>
<td>1 cm 2 mm = 12 mm 30 cm 3 mm = 303 mm</td>
</tr>
<tr>
<td></td>
<td>10 cm 2 mm = 102 mm 3 m 30 cm = 3300 mm</td>
</tr>
<tr>
<td></td>
<td>102 cm = 1020 mm 3 m 3 cm = 3030 mm</td>
</tr>
<tr>
<td></td>
<td>120 cm = 1200 mm 3 m 3 mm = 3003 mm</td>
</tr>
<tr>
<td></td>
<td>1 m 2 cm = 1020 mm 33 cm 3 mm = 333 mm</td>
</tr>
<tr>
<td></td>
<td>1 m 2 mm = 1002 mm 30 cm 30 mm = 330 mm</td>
</tr>
</tbody>
</table>

| b) | Read: *List them in increasing order.* Deal with one part at a time. Review orally round class. Mistakes corrected. |
| | Solution: |
| i) | 12 mm < 102 mm < 120 mm < 1002 mm < 1020 mm = 1020 mm < 1200 mm |
| | ii) 33 mm < 303 mm < 330 mm < 333 mm < 3003 mm < 3030 mm < 3300 mm |

| 42 min |

<table>
<thead>
<tr>
<th>10</th>
<th><strong>Oral practice</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>T says a length. Ps give it rounded to nearest cm.</td>
<td></td>
</tr>
<tr>
<td>e.g.</td>
<td>358 mm (36 cm); 612 mm (61 cm); 949 mm (95 cm); 1057 mm (106 cm), etc.</td>
</tr>
<tr>
<td>Ps explain reasoning too. If problems, write on BB.</td>
<td></td>
</tr>
<tr>
<td>e.g.</td>
<td>BB: 1057 mm = 105 cm 7 mm = 105.7 cm (so rounds up to next whole cm)</td>
</tr>
</tbody>
</table>

| 45 min |

**Notes**

Ps have rulers on desks

Individual work, monitored, helped

Initial whole class discussion about possible lengths and ways of writing them

BB:

| 11.5 cm ≤ length < 12.5 cm |
| 115 mm ≤ length < 125 mm |

T reminds Ps how to draw lines of a certain length accurately e.g. 11.7 cm

Agreement, praising

Individual work, monitored, helped

Differentiation by time limit

Discussion, reasoning, agreement, self-correction, praising

Or done as whole class activity orally round class

More able Ps could be asked to put the original measures in order.

Whole class activity

T chooses Ps at random

Reasoning, agreement, praising
<table>
<thead>
<tr>
<th>Activity</th>
<th>Notes</th>
</tr>
</thead>
</table>
| Revision exercises from *PbY3a, page 80* | }