Bk3

R: Rectangle, square. Calculation.

C: 2-D and 3-D shapes. Solids: cubes, cuboids. Plane shapes: polygons

E: Geometric names of components. Various shapes.

Lesson Plan 41

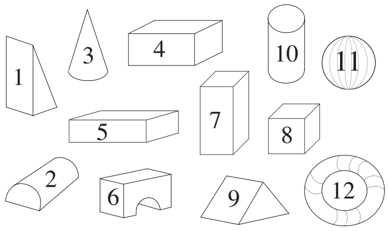
Activity | ***Notes***

1

Solids 1

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

e.g.



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

10 min

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: 4×2, 4×3, 3×2; 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) .

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

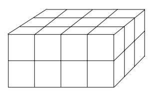
Elicit that it has 6 faces, all congruent (equal) squares, 8 vertices and 12 edges, all of length 4 cm.

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

Vertices: 8 Edges:: 12

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

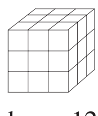
(Do not expect Ps to learn the geometric names yet, just to become familiar with them)

b) BB similar to part a), plus

similar congruent

Agreement, praising

c) BB:



Faces: 6 squares

Vertices: 8 Edges: 12

16 min

Bk3

Lesson Plan 41

Activity		*Notes*
3	**Cubes and cuboids**	Whole class activity

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

(24 unit cubes: 4 in a row, 3 rows : 3 × 4 = <u>12</u> on the bottom layer, 2 layers: 12 + 12 = <u>24</u>)

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 <u>net</u> 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 × 3 × 3) Elicit it is made from 27 unit cubes: 3 in a row, 3 rows (3 × 3 = <u>9</u>) on the bottom layer, 3 layers: 9 + 9 + 9 = 3 × 9 = <u>27</u>

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.

22 min

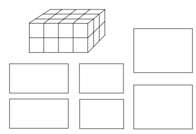
Notes:

Whole class activity

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

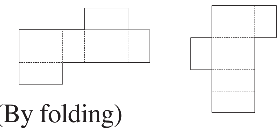
Drawn on BB or use copy master, enlarged, cut out and stuck to BB.

BB:



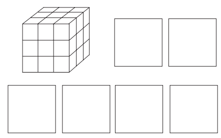
Agreement, praising

<u>Nets for a cuboid</u>

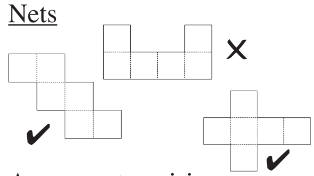


(By folding)

BB:



<u>Nets</u>



Agreement, praising

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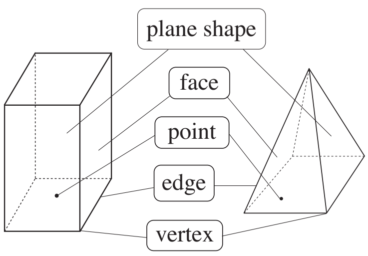
4 **Names of components**

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 <u>point</u> can be anywhere in/on the solid (inside, on the surface, on an edge, at a vertex).

25 min

Notes:

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

Bk3		*Lesson Plan 41*

Activity		***Notes***

5

Book 3, page 41

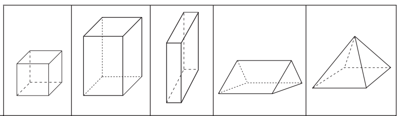
Q.1 Read: *Complete the table for these solids.*

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:



Number of faces	6	6	6	5	5
Number of vertices	8	8	8	6	5
Number of edges	12	12	12	9	8
Extension Number of □	6	2	–	–	1
Number of ▯ (rectangles which are not squares)	–	4	6	3	–
Number of △	–	–	–	2	4

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

30 min

6

Book 3, page 41

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

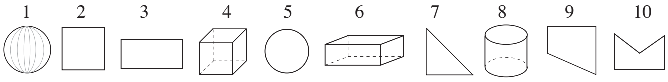
Revise meaning of 'plane shapes' (2-D, flat, only width and height) and 'quadrilaterals' (plane shape with 4 straight sides)

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:

1 2 3 4 5 6 7 8 9 10



Plane shapes	Rectangles	Solids	Quadrilaterals
2, 3, 5, 7, 9, 10	2, 3	1, 4, 6, 8	2, 3, 9

Individual work, monitored

Drawn on BB or use enlarged copy master or OHP

Discussion, agreement, self-correction, praising

T should have models of the solids to show if possible

Extra praise if Ps know names of shapes not yet dealt with in class

Feedback for T

34 min

7

Book 3, page 41

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.

Individual work, monitored

Drawn on BB or use enlarged copy master or OHP

(Ps could have the shapes cut out on desks too.)

Discussion, agreement, self-correction, praising

Solution:

a) quadrilaterals: 1, 5, 6, 8, 11, 12

b) rectangles: 1, 8, 11

c) squares: 8, 11

38 min

Bk3

Lesson Plan 41

Activity		*Notes*

8

Book 3, page 41

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.

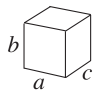
Ps have 4 plastic bags, each containing 12 unit cubes on desks. They make 4 different cuboids using 12 unit cubes for each one.

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.



Cuboids

	1	2	3	4
Edge a =	1	1	1	2
Edge b =	1	2	3	2
Edge c =	12	6	4	3

Notes: Individual (or paired) work, monitored, helped

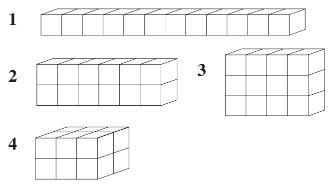
Table drawn on BB or use enlarged copy master or OHP

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.



Extension

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

Cuboid 1: $4 \times 12 + 2 \times 1 = 48 + 2 = \underline{50}$ unit squares

Cuboid 2: $2 \times 12 + 2 \times 6 + 2 \times 2 = 24 + 12 + 4 = \underline{40}$ unit sq.

Cuboid 3: $2 \times 12 + 2 \times 4 + 2 \times 3 = 24 + 8 + 6 = \underline{38}$ unit sq.

Cuboid 4: $4 \times 6 + 2 \times 4 = 24 + 8 = \underline{32}$ unit squares

Notes: Individual (or paired work)

Review findings with whole class

Calculations written on BB

Praising

45 min

Bk3	R: 3-D and 2-D shapes **C: Parallel and perpendicular lines (plane)** *E: Distance apart of parallel lines*	*Lesson Plan 42*

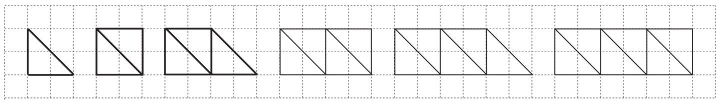
Activity		*Notes*

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.

Notes:

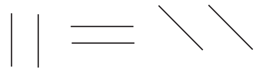
Whole class activity

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)

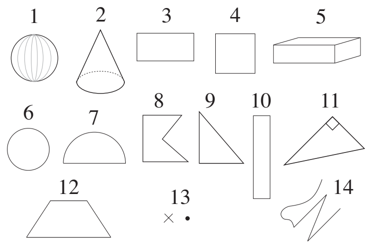
Praising

5 min

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.

a) Which are solids? (1, 2, 5)

b) Which are plane shapes ? (3, 4, 6, 7, 8, 9, 10, 11, 12)

c) Which are lines? (14, but also accept the sides of each plane shape)

d) Which are points? (13, but also accept points on each shape)

e) Which are rectangles? (3, 4, 10)

f) Which are quadrilaterals but not rectangles? (12)

g) Which have parallel lines? (3, 4, 5, 8, 10, 12, 14)

h) Which have perpendicular lines (right angles)? (3, 4, 5, 8, 9, 10, 11)

Notes:

Whole class activity

Drawn on BB or use enlarged copy master or OHP

At a good pace

Involve several Ps

Discussion, agreement, praising

Feedback for T

If problems, T (or P who knows) again confirms what each term means

Elicit that in rectangles parallel sides are opposite each other.

10 min

3

Parallel lines

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

a) horizontal and parallel b) slanting and parallel
c) one crossing over the other d) vertical and parallel
e) not parallel

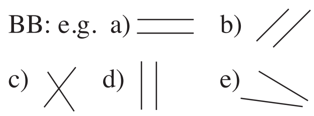
How can we be sure that lines are parallel? (Parallel lines will always stay the same distance apart, however far you extend them, so will never touch or cross over each other.)

Notes:

Whole class activity

Ps work on desks and T draws on BB (use a BB ruler)

BB: e.g.



Agreement, checking, praising

15 min

Bk3

Lesson Plan 42

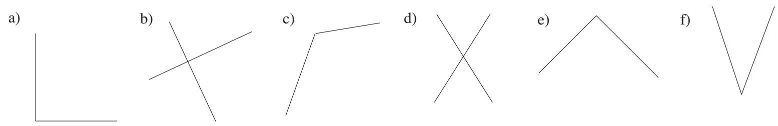
Activity		*Notes*

4

Perpendicular lines

Which of these diagrams are similar and which are different?

BB:



T asks several Ps what they think. Elicit that in:

- a), b) and e), the lines are perpendicular (form right angles)
- c), d), e) and f), the lines are 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.

Notes:

Whole class activity

Drawn on BB or use enlarged copy master or OHP

Ps come to BB to explain and show what they notice

Discussion, reasoning, agreement, praising

T quickly monitors, correcting, praising

In unison, on command

At speed

In good humour!

20 min

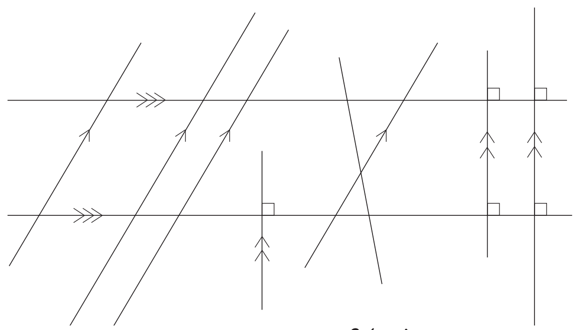
5

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.

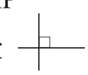
Solution:



Notes:

Whole class activity

Drawn on BB or use enlarged copy master or OHP

BB: perpendicular 

parallel: *1st set* *2nd set* *3rd set*

e.g. 

Agreement, praising

Check perpendicular lines by using a square corner.

Check parallel lines by measuring perpendicular distance apart at both ends

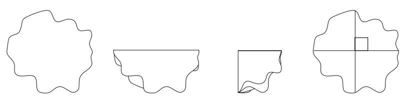
24 min

6

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.



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

Notes:

Whole class activity with individual folding

Pieces of paper can be of various shapes and sizes

Ps check with a square corner (e.g. corner of a number card or ruler)

Agreement, praising

26 min

Bk3

Lesson Plan 42

Activity		Notes

7

Book 3, page 42

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

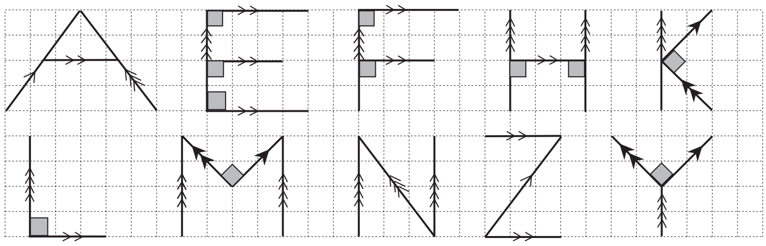
b) Colour a square at all the corners which are right angles.

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

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)

8

Book 3, page 42

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 <u>inside</u> of rails.

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

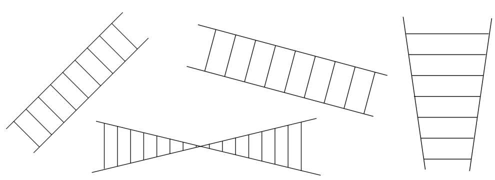
Elicit the unit of measure being used and that mm are shown by the smallest 'ticks' on the ruler..

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

Solution: <u>20</u> 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)

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)

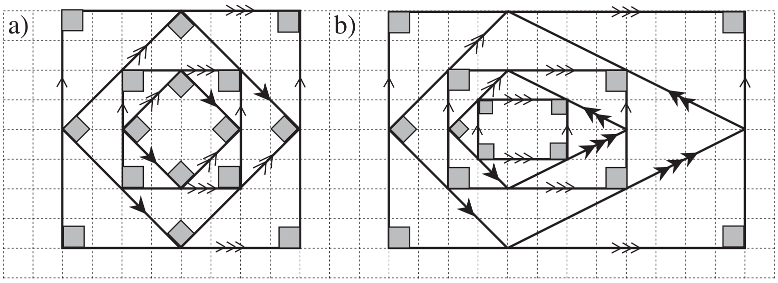
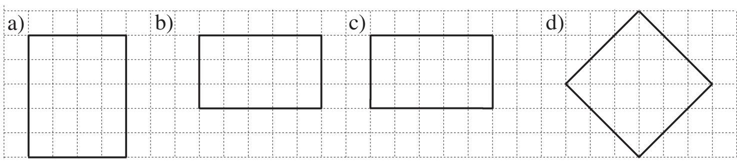
Whole class activity

Drawn on BB or use enlarged copy master or OHP

Discussion involving several Ps, agreement, praising

Bk3

Lesson Plan 42

Activity		Notes
9	***Book 3, page 42*** Q.3 Read: *Draw over in the same colour the sets of lines which are parallel. Use a different colour for each set.* *Colour the squares at corners which are right angles.* T again advises Ps to work logically as before and to colour small squares to show the right angles. 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. Ps colour any parallel lines and right angles that they missed. *Solution:* (arrows given for T only)  *40 min*	Individual work, monitored, helped Use enlarged copy master or OHP Differentiation by time limit (Only more able Ps expected to do both parts) Discussion, agreement, self-correcting, praising a) 4 sets of parallel lines, 16 right angles (4 in each of 4 squares) b) 6 sets of parallel lines 14 right angles (4 in each of 3 rectangles and 2 at top of kites) (Copy master could be enlarged onto card for Ps to colour, cut out as use as Christmas decorations)
10	***Book 3, page 42*** Q.4 Read: *Complete the drawing to make rectangles.* What can you tell me about a rectangle? (4 sides, 4 square corners or right angles, opposite sides equal and parallel.) Some parts of these rectangles have been rubbed out by mistake. Let's see if you can draw them in. Review at BB with whole class. Mistakes corrected Note that part d) is a square but accept a rectangle if Ps extend sides beyond grid lines. *Solution:*  Which rectangles are congruent? (b) and c)) *45 min*	Individual work, monitored Initial whole class discussion Drawn on BB or use enlarged copy master or OHP Differentiation by time limit Discussion, agreement, self-correction, praising (Or whole class activity if time is short) Extra praise if Ps remember without help

Bk3	R: Mental calculation **C: Fraction: halves, quarters, thirds** *E: Models*	*Lesson Plan 43*
Activity		***Notes***
1	**Mental practice** • 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.)	Whole class activity At speed round class If P makes a mistake, next P corrects it. Agreement, praising Feedback for T
	6 min	
2	**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, . . .) (× 2) (*Rule*: each following term is twice the previous term) b) 2, 6, 18, . . . (54, 162, 486, . . .) (× 3) (*Rule*: each following term is 3 times the previous term) c) 160, 80, 40, . . . (20, 10, 5, 2 and a half, . . .) (÷ 2) (*Rule*: each following term is half of the previous term)	Whole class activity Discussion on the rule. Involve several Ps Ps dictate terms and T writes on BB. Agreement, praising Feedback for T
	10 min	
3	**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 = 1 $\boxed{\text{half}}$ + 1 $\boxed{\text{half}}$ = $\boxed{2}$ 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 = 1 $\boxed{\text{third}}$ + 1 $\boxed{\text{third}}$ + 1 $\boxed{\text{third}}$ = $\boxed{3}$ 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)	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. Discussion, agreement, praising Individual work, monitored, reviewed, corrected Discussion, agreement, praising Check with the amounts Ps copy into *Ex. Bks*.
	18 min	

Bk3

Lesson Plan 43

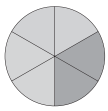
Activity		*Notes*

4

Parts of a whole 2

Let's help *Freddie Mouse*. On Sunday, he was given this box of cheese.

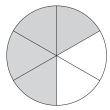
BB: Sunday



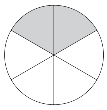
How many pieces of cheese are in the box? (6)

- 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)

Monday



- Tuesday



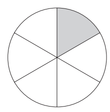
On Tuesday, he ate 2 more pieces of cheese.
What part of Monday's amount of cheese did he have left? (half)

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)

Wednesday



23 min

Notes:

Whole class activity

Drawn on BB or use enlarged copy master or OHP

(or pieces of cheese cut out and stuck on BB and Ps remove appropriate pieces each time, or real box of cheese)

Discussion, reasoning, agreement, praising

BB: T may write:
1 third of 6 = 2
1 half of 4 = 2

2 sixths + 2 sixths + 1 sixth + 1 sixth = 6 sixths = 1 whole

5

Book 3, page 43

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.

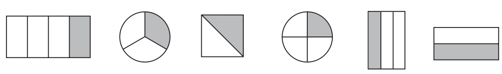
Read: *a) Piggy wanted to taste each cake right away. What part of these cakes did Piggy eat before the party?*

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.

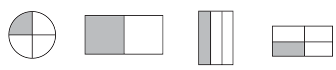
Solution:

a)



1 quarter 1 third 1 half 1 quarter 1 third 1 half

b) e.g.



1 quarter 1 half 1 third 1 quarter

30 min

Notes:

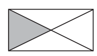
Individual work, monitored, <u>helped</u>

Drawn on BB or use enlarged copy master or OHP

Discuss shapes of cakes and how many <u>equal</u> slices they have been cut into

Reasoning, agreement, self-correction, praising

b) Praise creative solutions
e.g.



1 quarter

6

Book 3, page 43

Q.2 Read: *Colour one half of each shape in red and the other half in blue.*

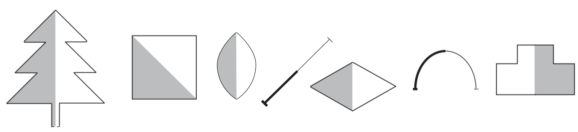
Discuss the difference between plane shapes (which have adjoining sides) and line shapes (not joined up).

Elicit that shapes first have to be divided into two <u>equal</u> parts.

Review at BB with whole class. Deal with all solutions

Solution:

e.g.



Where can you see halves in the classroom? Ps suggest some.

35 min

Notes:

Individual work, monitored, (helped)

Drawn on BB or use enlarged copy master or OHP

Discussion, agreement, self-correction, praising

BB: 1 half + 1 half = 2 halves
= 1 whole

Praise creative solutions

Class agrees/disagrees

Bk3

Lesson Plan 43

Activity		*Notes*

7

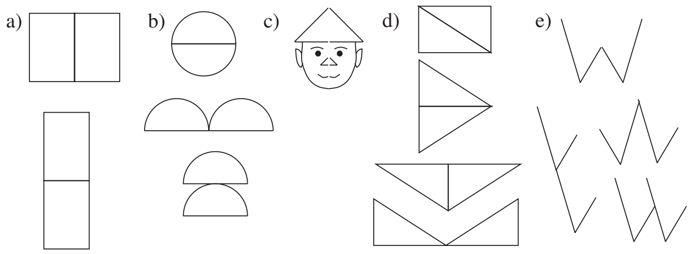
Book 3, page 43

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.



Extension

Notes:

Individual work, monitored, helped

Drawn on BB or use enlarged copy master or OHP

T could have the shapes cut from card for Ps to manipulate on BB.

Discussion, agreement, self-correction, praising

Praise creative solutions

Which are symmetrical? (Ps show and explain)

Talk about symmetry, mirror images and mirror lines

(Ps might remember from Y2)

40 min

8

Book 3, page 43, 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 cm ÷ 2 = 100 cm ÷ 2 + 10 cm ÷ 2
= 50 cm + 5 cm = <u>55 cm</u>

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 = <u>£60</u>

Check: £30 + £30 = £60

Answer: Lucy has £60 now.

Notes:

Individual work, monitored, (helped)

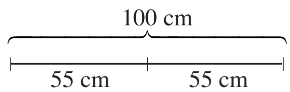
Ps read out problems

Give Ps enought time to solve problem

In unison

Reasoning, agreement, self-correcting, praising

BB:

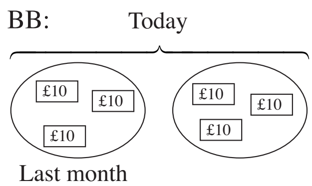


P reads out question

In unison

Reasoning, agreement, self-correcting, praising

BB:



45 min

Bk3	R: Mental calculation (4 operations) **C: Fractions: halves, quarters, thirds. Unit fractions** *E: 2 quarters, 3 quarters, 4 quarters; 2 thirds, 3 thirds*	*Lesson Plan 44*
Activity		***Notes***
1	**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: £50 £50 £50 £2 £20 £20 £20 £20 £20 £5 £5 £5 $3 \times £50 + £2 = £152$ $5 \times £20 + 3 \times £5 = £100 + £15 = £115$ $£152 > £115$ $£152 - £115 = £52 - £15 = £42 - £5 = \underline{£37}$ b) BB: £50 £20 £20 £20 £1 £50 £50 £1 £2 £2 £2 £2 $£50 + 3 \times £\,20 + £1 = £50 + £60 + £1 = £111$ $2 \times £50 + 4 \times £2 + £1 = £100 + £\,8 + £1 = £109$ $£111 > £109$ $£111 - £109 = £11 - £9 = \underline{£2}$ *6 min*	Whole class activity Drawn on BB or use copy master, enlarged, cut out and items stuck to BB Discussion, agreement, praising Ps copy into *Ex. Bks.* (Heading: Lesson and date)
2	**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) *10 min*	Whole class activity At a good pace Ps dictate answers, T writes on BB (or Ps list in *Ex. Bks.*) Encourage Ps to think logically Agreement, praising
3	**Addition** Let's practise addition. (T has SB or BB or OHP already prepared.) BB: a) $2 + 7 = (9)$ $20 + 70 = (90)$ $120 + 70 = (190)$ $2 + 70 = (72)$ b) $5 + 8 = (13)$ $5 + 80 = (85)$ $50 + 80 = (130)$ $50 + 180 = (230)$ c) $3 + 9 + 6 = (18)$ $30 + 90 + 60 = (180)$ $30 + 90 + 6 = (126)$ Discuss relationships, e.g. $10 \times 2 + 10 \times 7 = 10 \times 9$; $100 + 20 + 70 = 100 + 90 = 190$; $50 + 180 = 5$ tens $+ 18$ tens $= 23$ tens $= 230$, etc. *15 min*	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 the answers too Discussion, agreement, praising

Bk3		*Lesson Plan 44*
Activity		***Notes***
4	**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 tens – 9 tens – 7 tens = 9 tens – 7 tens = 2 tens = 20 $180-9-7 = 180-(9+7) = 180-16 = 164$ *20 min*	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)
5	**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. $45\times 3 = 40\times 3+5\times 3 = 120+15 = 135$ $84\div 4 = 80\div 4+4\div 4 = 20+1 = 21$ $75\div 5 = 50\div 5+25\div 5 = 10+5 = 15$ $121\div 11 = 110\div 11+11\div 11 = 10+1 = 11$ *25 min*	Whole class activity T has SB or BB or OHP already prepared T reads them out, Ps copy in *Ex. Bks*, writing results too. At a good pace Less able Ps might only be expected to do part a) Encourage speed in writing and calculating Ps think of easy ways to do the difficult calculations Agreement, self-correcting, evaluation, praising Quick discussion on methods of calculation Stars, stickers, points, etc. awarded for good work
6	***Book 3, page 44*** 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) *30 min*	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 choose a shape and colour. BB 2 quarters = 1 half 4 quarters = 1 unit

Bk3

Lesson Plan 44

Activity		Notes

7

Book 3, page 44

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.

Extension

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)

35 min

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

8

Book 3, page 44

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

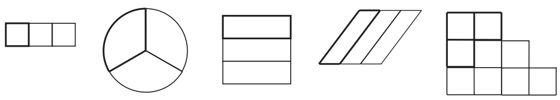
b) *Each drawing is 1 quarter of a shape.*
Complete it to make the whole shape.

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.

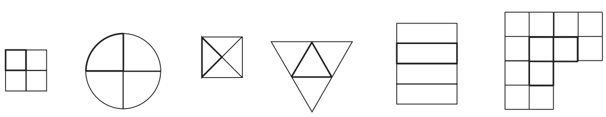
Deal with one part at a time. Review at BB with whole class. Discuss different solutions.

Solution: e.g.

a)



b)



40 min

Notes:

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

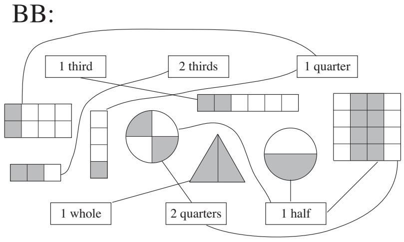
9

Book 3, page 44, 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)?

45 min

Notes:

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

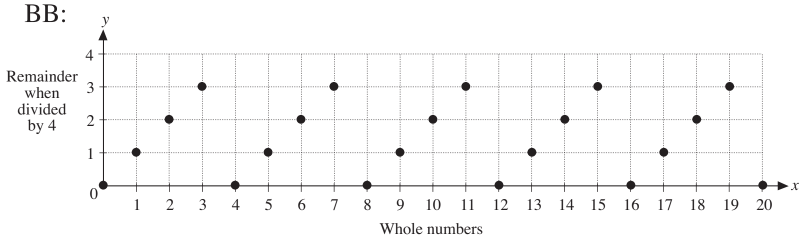
Bk3

R: Mental calculation

C: Time: quarter, half, three quarters of an hour; 15, 30, 45 minutes

E: Sequences of congruent numbers

Lesson Plan 45

Activity		*Notes*
1	**Missing numbers** Which numbers are missing from these equations? BB: a) $16 + 4 = \boxed{}$ $\quad 160 + \boxed{} = 200$ $\quad \boxed{} + 140 = 200$ $\quad 15 + 3 = \boxed{}$ $\quad 150 + \boxed{} = 180$ $\quad \boxed{} + 130 = 180$ b) $20 - 5 = \boxed{}$ $\quad 200 - \boxed{} = 150$ $\quad \boxed{} - 150 = 50$ $\quad 17 - 4 = \boxed{}$ $\quad 170 - \boxed{} = 130$ $\quad \boxed{} - 140 = 30$ Discuss methods of calculation and relationships/connections. e.g. $160 + \boxed{} = 200$: $200 - 160 = \underline{40}$, $160 + \underline{40} = 200$ $170 - \boxed{} = 130$: $170 - 130 = \underline{40}$, $170 - \underline{40} = 130$ $\boxed{} - 140 = 30$: $140 + 30 = \underline{170}$, $\underline{170} - 140 = 30$ *5 min*	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
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. *10 min*	Individual work, monitored Ps nod their heads when they are ready for next calculation Quick checking after each part Agreement, self-correction, praising Deal with all mistakes Feedback for T
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 <u>horizontal</u> and shows the whole numbers, y axis is <u>vertical</u> and shows the remainders; x axis and y axis are <u>perpendicular</u> 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 <u>parallel</u> lines of dots, why there are no dots on the horizontal grid line at 4 on y axis, etc.) *15 min*	Whole class activity Drawn on BB or use enlarged copy master or OHP Initial revision of components of a graph Ps come to BB to draw dots to show the remainders, explaining reasoning Class points out errors Agreement, praising In unison <u>Note for T</u> Sequences of <u>congruent</u> numbers, difference 4
4	***Book 3, page 45*** 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 *20 min*	Individual work, monitored (helped) Drawn on BB or use enlarged copy master or OHP Agreement, self-correction, praising

Bk3

Lesson Plan 45

Activity		*Notes*

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)

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)

23 min

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 5's. 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 .

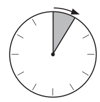
BB: 1 quarter of an hour = 60 minutes ÷ 4 = 15 minutes
3 quarters of an hour = 1 quarter + 1 quarter + 1 quarter
= 15 minutes + 15 minutes + 15 minutes
= 45 minutes

Notes: Whole class activity

T has large real and model clocks.

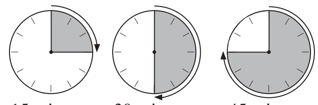
BB: 1 hour = 60 minutes

In unison



5 minutes

BB: 60 min. ÷ 12 = 5 min.



15 minutes 30 minutes 45 minutes

Discussion, reasoning, agreement, praising

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

28 min

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 eactly 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

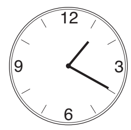
Use copy master *Y2 LP 103/1*

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

32 min

Bk3

Lesson Plan 45

Activity		*Notes*
8	***Book 3, page 45*** 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.	Individual work, monitored, helped Use enlarged copy master or OHP or show times on model clock

Solution:

	Clock 1	Clock 2	Clock 3	Clock 4
hours	7	11	12 or 0	3
minutes	30	15	45	55

Agreement, self-correction, praising

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?

Talk about am and pm and the 24 hour clock

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)

T asks Ps at random. Class agrees/disagrees. Praising

36 min

9 ***Book 3, page 45***

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.*

Whole class activity

Table drawn on BB or use enlarged copy master or OHP

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.

At a good pace

Reasoning, agreement, praising

Solution:

Minute hand points to:	12	1	2	3	4	5	6	7	8	9	10	11
Minutes shown	0 or 60	5	10	15	20	25	30	35	40	45	50	55

Discuss the case of '12' being either 0 or 60 minutes

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

Individual work, monitored, helped

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

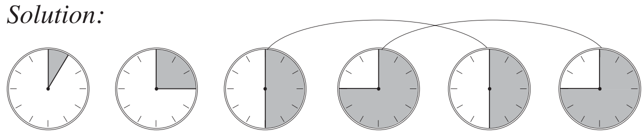
T demonstrates on BB

Review at BB with whole class. Deal with all mistakes.

C, which clocks did you join up? Why? Who agrees? Who thinks another pair? etc.

Reasoning, agreement, self-correcting, praising

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)

41 min

Bk3		*Lesson Plan 45*
Activity		***Notes***
10	***Book 3, page 45, Q.4*** Read: *Compare the two sides. Write the correct sign between them.* Ps come out to BB to write in the missing signs, explaining reasoning. Class agrees/disagrees. If problems, demonstrate on model clock. For inequalities, Ps also say how many minutes more or less. *Solution:* a) half an hour (30 min) $\boxed{<}$ 35 min b) 15 min $\boxed{=}$ quarter of an hour (15 min) c) 50 min $\boxed{>}$ 3 quarters of an hour (45 min) d) 1 hour $\boxed{=}$ 60 min e) a quarter of an hour + 5 min (20 min) $\boxed{<}$ half an hour – 5 min (25 min) f) 20 min + half an hour (50 min) $\boxed{>}$ a quarter of an hour + half an hour (45 min)	Whole class activity Written on BB or use enlarged copy master or OHP Ps write in *Pbs* too At a good pace Reasoning, agreement, praising Feedback for T (Or as individual work, monitored, helped, with time-limit differentiation)

45 min

Bk3

R: Calculations

C: Time: quarter, half, three quarters of an hour

E: Thirds of an hour

Lesson Plan 46

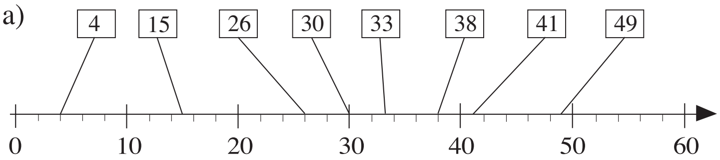
Activity | *Notes*

1

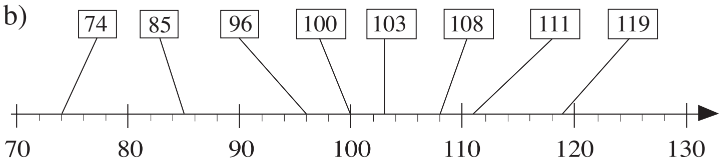
Number line

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

a)



b)



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.

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

5 min

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:

a	**106**	**132**	**200**	**113**	**158**	**121**	**185**	197	146	93
b	**56**	**82**	**150**	63	108	71	135	**147**	**96**	**43**

Notes: Whole class activity

Drawn on BB or use enlarged copy master or OHP

Reasoning, agreement, praising

Rule: $a \xrightarrow{50} b$

$a = b + 50$

$b = a - 50$

$a - b = 50$

Bold numbers given

10 min

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: $56 + 140 \div 2 = 56 + 70 = \underline{126}$

b) The difference between 140 and half of 56. Show . . .now! (112)

BB: $140 - 56 \div 2 = 140 - 28 = 140 - 20 - 8 = 120 - 8 = \underline{112}$

c) Half of the sum of 140 and 56. Show me . . . now! (98)

BB: $(140 + 56) \div 2 = 196 \div 2 = 100 \div 2 + 80 \div 2 + 16 \div 2$

$= 50 + 40 + 8 = \underline{98}$

d) Half of the difference between 140 and 56. Show . . . now! (42)

BB: $(140 - 56) \div 2 = (140 - 40 - 10 - 6) \div 2 = 84 \div 2 = \underline{42}$

e) The difference between 140 and 2 times 56. Show . . . now! (28)

BB: $140 - 2 \times 56 = 140 - 2 \times 50 - 2 \times 6 = 140 - 100 - 12$

$= 40 - 12 = \underline{28}$

Notes: 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

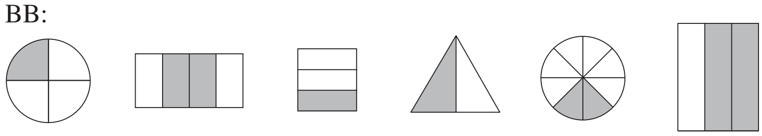
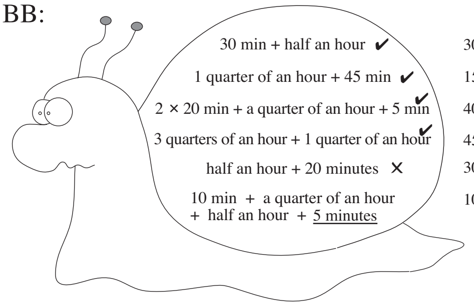
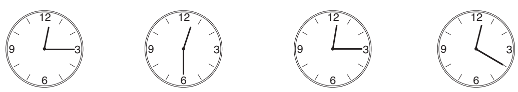
Ps explain easy ways to do the calculations

(Or done as mental practice if class is able)

15 min

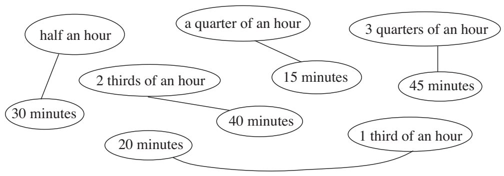
Bk3

Lesson Plan 46

Activity		*Notes*
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 eighths 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*	Whole class activity Drawn on BB or use enlarged copy master or OHP Reasoning, agreement, praising T repeats vague or inaccurate reasoning concisely/correctly as a model for Ps to follow Feedback for T T chooses Ps at random
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:  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	Whole class activity Drawn on BB or use enlarged copy master or OHP BB: 1 hour = 60 minutes In unison. At a good pace. T writes what Ps dictate Elicit that it is easier to do the calculations when all the times are in minutes Agreement, praising
Extension	Who can think of other additions *Sammy Snail* could have written? *25 min*	T chooses Ps at random
6	***Book 3, page 46*** 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?	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
Extension	*Solution:*  12 h 15 min; 12 h 30 min; quarter of an hour; 12 h 20 min *30 min*	What would the times be using the 24 hour clock? (00:15, 00:30: 12:15, 00:20)

Bk3

Lesson Plan 46

Activity		Notes
7	***Book 3, page 46*** 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:*  *35 min*	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)
Extension		What other fractions of an hour can you think of? (e.g. 1 sixth of an hour = 60 min ÷ 6 = 10 min) Praising
8	***Book 3, page 46*** 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 + <u>1 quarter of an</u> hour = 1 hour b) 30 minutes + <u>half an</u> hour = 1 hour c) 20 minutes + half an hour + <u>10</u> minutes = 1 hour d) A quarter of an hour + a third of an hour + <u>25</u> minutes = 1 hour Let's think of other times which add up to 1 hour. e.g. T: '1 third of an hour', P_1: 'plus 10 min', P_2: 'plus half an hour', P_3: 'equals 1 hour'; etc. Class points out errors. *40 min*	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 Prase creativity
9	***Book 3, page 46, 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 ✔ d) 20 minutes = ~~2~~ thirds of an hour ✗ (1 third) e) 3 quarters of an hour = 45 minutes ✔ f) 2 thirds of an hour = 1 quarter of an hour + ~~5~~ minutes ✗ (25) g) 2 quarters of an hour = 1 quarter of an hour + 15 minutes ✔ *45 min*	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.

Bk3	R: Operations. Fractions **C: Time. 24 hour clock** *E: Sequences of time*	*Lesson Plan 47*

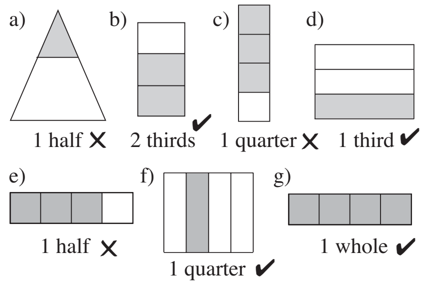
Activity		*Notes*

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:



<u>Reasoning</u>: e.g.

a) 2 parts but not equal

c) 4 equal parts, but only 1 should be shaded, not 3.

e) 4 equal parts, so 2 parts should be shaded, not 3.
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.

Notes:

Whole class activity

Drawn on BB or use enlarged copy master or OHP

Elicit that the task was to shade each shape to show the fraction below it.

Reasoning, agreement, praising

T repeats vague or inaccurate reasons correctly

What mark would you give *Barry Bear*? Wha comment would you write beside it?

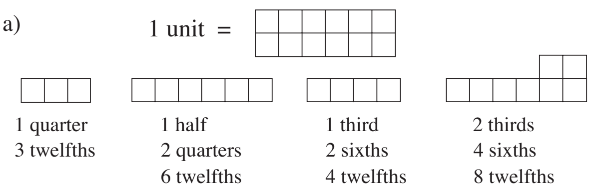
5 min

2

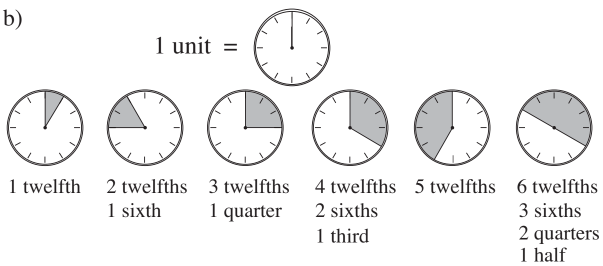
Fractions 2

What fraction of the whole unit are these shapes if:

a)



b)



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?

Notes:

Whole class activity

Drawn on BB or use enlarged copy master or OHP

(or shapes cut out of coloured paper and stuck to BB)

Reasoning, agreement, praising

In part b), also ask for

- the fraction unshaded
- the number of minutes in the shaded (unshaded) parts

T give hints about fractions not suggested by Ps

Discussion, reasoning, agreement, praising

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. $\boxed{09:05}$ (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.

Notes:

Whole class discussion

T has analogue clock and digital 12 hour/24 hour clocks

Ps have model analogue clocks on desks

In unison. T sets analogue clock too as a check.

BB: 1 day = 2 × 12 hours
= 24 hours

1 hour = 60 minutes

Discussion, demonstration of the 24 hour clock and why it never shows 24:00. (Midnight is always 00:00)

16 min

Bk3

Lesson Plan 47

Activity		*Notes*

4

Time sequences

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

BB: 9:05, (9:30, 9:55, 10:20, 10:45, 11:10, 11:35, 12:00, 12:25, 12:50, 13:15, 13:40, 14:05, 14:30, 14:55, 15:20, 15:45, . . .)

T points to some and asks Ps to say 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

Notes: Whole class activity

T starts, then writes what Ps dictate.

At a good pace

Praising, encouragement only

T shows on model clocks

21 min

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.

Notes: Whole class activity

At a good pace

Praising, encouragement only

T sets model or real clock as a check.

25 min

6

Book 3, page 47

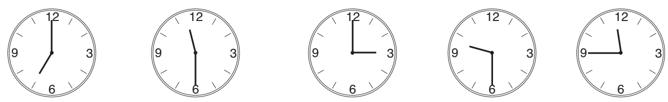
Q.1 Read: *Write the times shown on the clocks in 3 different ways.*

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

Review at BB with whole class. Mistakes corrected.

Solution:

a) morning	b) nearly mid-day	c) afternoon	d) evening	d) night



7 h 0 min	11 h 30 min	3 h 0 min	9 h 30 min	11 h 45 min
7.00 am	11.30 am	3.00 pm	9.30 pm	11.45 pm
07:00	11:00	15:00	21:30	23:45

How would we normally <u>read</u> or <u>say</u> the time on the clocks? (seven o'clock, half past eleven, three o'clock, etc.)

Notes: Individual work, monitored, helped

Use enlarged copy master or OHP

Discussion, reasoning, agreement, self-correction, praising

Feedback for T

Check on real/model clocks if there are problems

T points to each clock in turn and class reads time in unison

30 min

7

Book 3, page 47

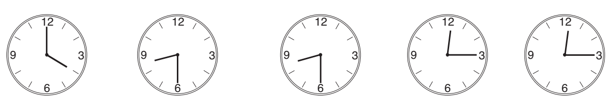
Q.2 Read: *Draw hands on the clocks to show the times given.*
Write the time in a different way below each clock.

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

a) 4.00 am	b) 8.30 pm	c) 8.30 am	d) 12.15 pm	e) 0.15 am



e.g.

4 h 0 min	20:30	8 h 30 min	12:15	0 h 15 min

Notes: Individual work, monitored, helped

Use enlarged copy master or OHP

Encourage Ps to use rulers to draw straight lines.

Discussion, reasoning, agreement, self-correction, praising

Ps read out the times in unison

What would you normally be doing at this time of day?

35 min

Bk3

Lesson Plan 47

Activity | **Notes**

8

Book 3, page 47

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 = <u>60</u> minutes
1 minute = <u>60</u> seconds
1 day = <u>24</u> hours
2 days = <u>48</u> hours

b) half a day = <u>12</u> hours
a quarter of a day = <u>6</u> hours
a third of a day = <u>8</u> hours
3 quarters of an hour = <u>45</u> min

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 = <u>48</u> hours

b) 3 quarters of an hour = 60 min ÷ 4 × 3 = 15 min × 3 = <u>45</u> min

40 min

9

Book 3, page 47

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?

Elicit that '*H*' means Hours and '*D*' means 'Days'. **B**, come and write the rule. Who agrees? Who wrote it another way? etc.

Repeat for part b).

Solution:

a)

Days	1	2	1 quarter	3 quarters	1 third	2 thirds	1 eighth	1 half
Hours	24	48	6	18	8	16	3	12

$$H = 24 \times D, \quad D = H \div 24, \quad H \div D = 24$$

b)

Hours	1	3	5	1 half	1 quarter	1 and a half	1 third	2 thirds	1 sixth	1 fifth
Minutes	60	180	300	30	15	90	20	40	10	12

Extension

What is the rule?

$$M = 60 \times H, \quad H = M \div 60, \quad M \div H = 60$$

Notes:

Individual work, monitored, helped

Tables drawn on BB or use enlarged copy master or OHP

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

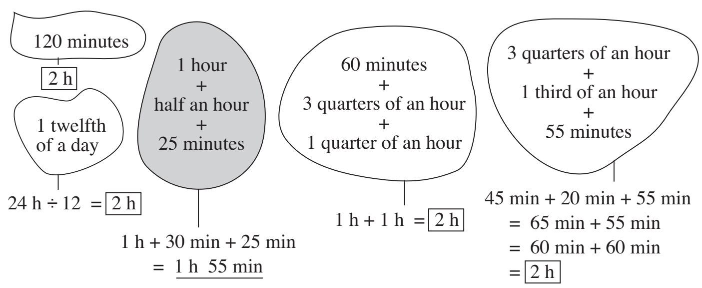
b) 3 × 60 = 180
5 × 60 = 300
60 ÷ 2 = 30
60 ÷ 4 = 15
60 ÷ 3 = 20
60 ÷ 3 × 2 = 20 × 2 = 40
60 ÷ 6 = 10
60 ÷ 5 = 12

45 min

Bk3	R: Mental calculation C: **Time: days, hours, minutes. Fractions of the day or hour** *E: Problems*	*Lesson Plan 48*
Activity		***Notes***
1	**Missing items 1** Ps come out to fill in missing numbers and signs, explaining reasoning. Class points out errors. BB: a) $20 \xrightarrow{+40} 60 \xrightarrow{+50} 110 \xrightarrow{+40} 150 \xrightarrow{+50} 200$ b) $200 \xrightarrow{-70} \boxed{130} \xrightarrow{-30} \boxed{100} \xrightarrow{-7} \boxed{93} \xrightarrow{-30} \boxed{63}$ c) $10 \xrightarrow{\boxed{+80}} 90 \xrightarrow{\boxed{+7}} 97 \xrightarrow{\boxed{+80}} 177 \xrightarrow{\boxed{+7}} 184$ d) $170 \xrightarrow{-50} 120 \xrightarrow{+8} 128 \xrightarrow{-50} 78 \xrightarrow{+8} 86$ *5 min*	Whole class activity Written on BB or use enlarged copy master or OHP At good pace Agreement, checking, praising Feedback for T (or done as a mental chain calculation and Ps show result)
2	**Missing items 2** Ps come out to fill in missing numbers and signs, explaining reasoning. Class points out errors. BB: a) $80 \xrightarrow{\times 2} 160 \xrightarrow{+20} 180 \xrightarrow{\div 3} 60 \xrightarrow{-10} 50$ b) $80 \xrightarrow{+20} \boxed{100} \xrightarrow{\boxed{\times 2}} 200 \xrightarrow{\boxed{\div 10}} 20 \xrightarrow{-3} \boxed{17}$ c) $80 \xrightarrow{-20} 60 \xrightarrow{\boxed{\times 3}} 180 \xrightarrow{\boxed{+10}} 190 \xrightarrow{\div 2} 95$ *9 min*	Whole class activity Written on BB or use enlarged copy master or OHP At good pace Agreement, checking, praising Feedback for T (or done as a mental chain calculation and Ps show result)
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*. BB: a) 1 week = $\boxed{7}$ days b) 1 hour = $\boxed{60}$ minutes c) 1 day = $\boxed{24}$ hours d) 1 minute = $\boxed{60}$ seconds e) 3 quarters of a day = $\boxed{18}$ hours f) 2 thirds of an hour = $\boxed{40}$ minutes g) 120 minutes = $\boxed{2}$ hours h) 150 minutes = $\boxed{2}$ hours $\boxed{30}$ minutes (= 2 and a half hours) i) 3 days = $\boxed{72}$ hours j) half a day = $\boxed{12}$ hours k) 1 third of a day = $\boxed{8}$ hours l) 3 twelfths of an hour = $\boxed{15}$ minutes (= 1 quarter of an hour) Review at BB with whole class. T writes what Ps dictate. Mistakes corrected. Write details of problem calculations on BB. *16 min*	Individual work, monitored, helped Ps nod heads when ready for T to continue Discussion, reasoning, agreement, self-correcting, praising BB: e.g. e) $24 \div 4 \times 3 = 6 \times 3 = 18$ f) $60 \div 3 \times 2 = 20 \times 2 = 40$ g) $120 = 60 + 60$ h) $150 = 60 + 60 + 30$ i) $3 \times 24 = 3 \times 20 + 3 \times 4 = 60 + 12 = 72$ l) $60 \div 12 \times 3 = 5 \times 3 = 15$

Bk3

Lesson Plan 48

Activity		*Notes*
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 orT 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] *20 min*	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
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) *24 min*	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
6	***Book 3, page 48*** 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:*  	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
Extension	Think of other values which add up to 1 h 55 min. *30 min*	Whole class activity or individual work in *Ex. Bks* Encourage creativity

Bk3

Lesson Plan 48

Activity		*Notes*

7

Book 3, page 48

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.

BB:

	15 min	20 min	
10 minutes <	1 quarter of an hour <	1 third of an hour <	
35 minutes <	3 quarters of an hour <	half a day	
	45 min	12 hours	

Notes: Individual work, monitored, (helped)

Discussion, reasoning, agreement, self-correction, praising

Write in one line on BB

Feedback for T

34 min

8

Train times

Look at this timetable. What does each column show? (When trains depart from *Sation 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.

T does first row with help of class: 7.45 to 10.30

7:45 to 8:00 is 15 min; 8:00 to 10:00 is 2 hours, then another 30 min

BB: 15 min + 2 h + 30 min = 2 h 45 min

Table completed by Ps at BB with help of T and rest of class if necessary.

Solution:

Departs from Station A at:	Arrives at Station B at:	Journey time:	
7:45	10:30	2 h 45 min	15 min + 2 h + 30 min = 2 h 45 min
11:55	14:20	2 h 25 min	5 min + 2 h + 20 min = 2 h 25 min
16:05	19:10	3 h 5 min	55 min + 2 h + 10 min = 2 h 65 min = 3 h 5 min
20:40	23:16	3 h 36 min	20 min + 2 h + 16 min = 2 h 36 min
22:25	01:53	3 h 28 min	35 min + 2 h + 53 min = 2 h 88 min = 3 h 28 min

Notes: Whole class activity

Table written on BB or use enlarged copy master or OHP

(Ps could have model clocks on desks to help them)

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?

40 min

9

Book 3, page 48

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.*

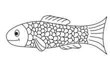
Review with whole class. T points to each one in turn. Who did you mark correct, *Sparrow* or *Trout*? Show me . . . now!

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 ✔	half a day	~~30 hours~~
~~14 hours~~	2 quarters of a day	12 hours ✔
4 hours ✔	1 sixth of a day	4 hours ✔
~~45 minutes~~	2 half hours	60 minutes ✔
15 minutes ✔	a quarter of an hour	~~20 minutes~~
40 minutes ✔	2 thirds of an hour	~~45 minutes~~
~~2 hours~~	1 eighth of a day	3 hours ✔
~~9 hours~~	2 sixths of a day	8 hours ✔
18 minutes ✔	3 tenths of an hour	~~20 minutes~~

Notes: Individual work, monitored, (helped)

Use enlarted 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

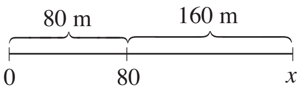
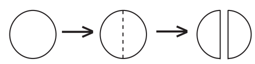
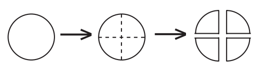
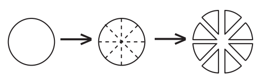
Feedback for T

45 min

Bk3

R: Calculations
C: Fractions. Problems in context
E Problem solving. Finding the rule

Lesson Plan 49

Activity		*Notes*
1	**Mental practice** T says a fraction of an amount, Ps say value. e.g. a) half of 30, 1 third of 30, 1 fifth of 30, 1 sixth of 30, 1 tenth of 30; b) half of 100, 1 quarter of 100, 1 fifth of 100, 1 tenth of 100, 1 third of 100. Discuss how to calculate the last fraction. (e.g. 100 ÷ 3 = 99 ÷ 3 + 1 ÷ 3 = 33 + 1 third = 33 and a third or 100 ÷ 3 = 33, remainder 1) *5 min*	Whole class activity At speed T chooses Ps at random If problems, write divisions on BB Praising, encouragement only
2	**Problem 1** Listen carefully, picture the story in your head and think how you would solve it. Write a plan, draw a diagram and do the calculation in your *Ex. Bks*. *A school decided to lay a crazy paved around the playing fields. Last month, workers paved 80 m of the path. This month they have paved another 160 m.* *What length have they paved altogether?* **A**, come and explain what you did. Who agrees? Who did it a different way? etc. Mistakes discussed and corrected. BB: *Plan:* Last month: 80 m This month: 160 m *Diagram*:  *Calculation:* x = 80 m + 160 m = <u>240 m</u> *Answer:* They have paved 240 m altogether. What fraction of the 240 m was paved last month (this month)? BB: 240 m = 80 m + (80 m + 80 m), or 240 m ÷ <u>3</u> = 80 m so 80 m = 1 third of 240 m; 160 m = 2 thirds of 240 m *Check:* 1 third + 2 thirds = 3 thirds = 1 whole *10 min*	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 (T might need to help with the diagram) Elicit other relationships too, e.g. 160 m is twice 80 m 240 m is 3 halves of 160 m, i.e. 1 and a half times 160 m
3	**Folding paper** Ps have 3 circular pieces of paper and scissors on desks. T has large brightly coloured pieces for demonstration. a) Fold one piece of paper into 2 equal parts, then cut along the fold. What is the value of each part? (1 half) T sticks pieces on BB. What equation could we write? b) Fold the next circle into 4 equal parts, then cut along the folds. What is the value of each part? (1 quarter) T sticks pieces on BB. What equation could we write? c) Fold the last circle into 8 equal parts, then cut along the folds. What is the value of each part? (1 eighth) T sticks pieces on BB. What equation could we write? What do you notice about the shapes? (e.g.  2 quarters = 1 half,  2 eighths = 1 quarter,  4 eighths = 1 half) *18 min*	Whole class activity T demonstrates folding/cutting and Ps copy, monitored, helped BB:  2 × 1 half = 1 whole BB:  4 × 1 quarter = 1 whole BB:  8 × 1 eighth = 1 whole Demonstrate by manipulating the cut-out shapes on the BB Praising

Bk3

Lesson Plan 49

Activity		*Notes*

4

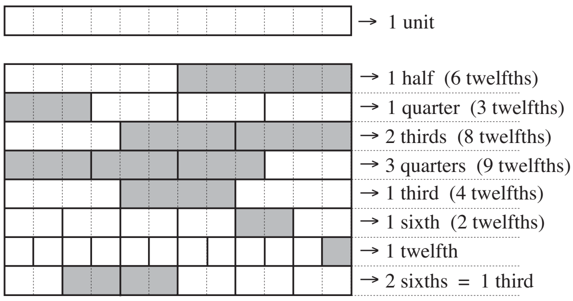
Book 3, page 49

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:



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)

What part of each unit is <u>not</u> 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 <u>not</u> 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 answerd correctly explains to others. Who agrees? Who did it a different way? Mistakes corrected.

Notes: Whole class activity

T repeats slowly and Ps repeat in own words.

BB:

a) i) 30 ÷ 6 = <u>5</u>

  ii) 30 – 5 = 25 → 5 sixths

or 1 whole – 1 sixth = <u>5 sixths</u>

b) S: 1 sixth of L = 30

  L: 6 × 30 = <u>180</u> (books)

Reasoning, agreement, self-correction, praising

30 min

6

Book 3, page 49

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 <u>area</u> of the garden (length × width) and area is <u>always</u> 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:

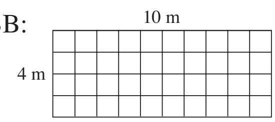
Part already dug	**1 fifth**	3 quarters	1 quarter	3 fifths	**1 half**	**2 tenths**	6 tenths	**4 fifths**
Part remaining	4 fifths	**1 quarter**	**3 quarters**	**2 fifths**	1 half	8 tenths	**4 tenths**	1 fifth
Area remaining	32 m^2	10 m^2	30 m^2	16 m^2	20 m^2	32 m^2	16 m^2	8 m^2

Notes: Individual work, monitored

Table drawn on BB or use enlarged copy master or OHP

Reasoning, agreement, self-correction, praising

BB:



<u>Area</u> = 4 m × 10 m
= 40 metre squares
= 40 m^2

Reasoning, agreement, praising

Write difficult calculations on BB: e.g.

40 ÷ 5 × 4 = 8 × 4 = 32

40 ÷ 4 × 3 = 10 × 3 = 30

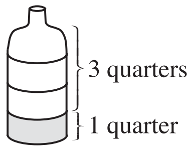
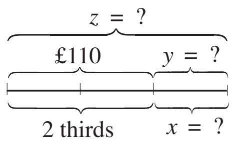
40 ÷ 10 × 4 = 4 × 4 = 16

Ps join up the equal fractions

35 min

Bk3

Lesson Plan 49

Activity		*Notes*
7	***Book 3, page 49*** 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. BB:  *40 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 = <u>1 quarter</u> b) 2 litres = 200 cl 200 cl ÷ 4 = <u>50 cl</u> c) 200 cl – 50 cl = 150 cl, or 200 cl ÷ 4 × 3 = 50 cl × 3 = <u>150 cl</u>
8	***Book 3, page 49, 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:  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*	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 = <u>£55</u> c) z = £110 + £55 = <u>£165</u> (i.e. 2 thirds + 1 third)

Bk3

R: Mental calculation

C: Fractions. Problems in context

E: Problem solving

Lesson Plan 50

Activity		*Notes*

1

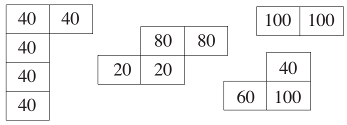
Puzzle

Find these shapes in the grid so that the numbers in each shape sum to 200.

BB:

40	40	80	40	160	80	80	180
40	60	60	80	20	20	60	80
40	20	40	140	140	120	80	40
40	160	100	100	160	20	60	100

e.g.



Ps come out to write numbers in shapes and show positions on grid.

Class checks that they are correct.

Notes: Whole class activity

Drawn on BB or use enlarged copy master or OHP

At a good pace

Check: $5 \times 40 = 200$

$2 \times (80 + 20) = 2 \times 100 = 200$, etc.

Agreement, praising

5 min

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:

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.

Notes: 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)

10 min

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.

Plan: Carton: 40 p Straw: 1 fifth of 40 p

Calculation: 40 p + 40 p ÷ 5 = 40 p + 8 p = <u>48 p</u>

or 40 p ÷ 5 = 8 p, 40 p + 8 p = <u>48 p</u>

Answer: A carton with a straw costs 48 p aaltogether.

Notes: Individual work, monitored, helped

T repeats slowly and Ps repeat in own words

Discussion on BB.

Reasoning, agreement, self-correction, praising

Feedback for T

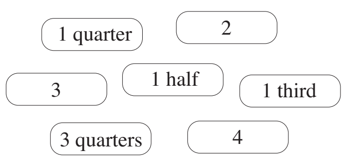
15 min

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

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

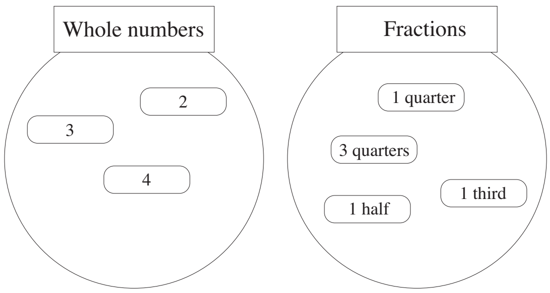
Discussion, agreement, praising

Bk3		*Lesson Plan 50*

Activity		*Notes*

4 (continued)

BB:



Notes: Drawn on BB or use enlarged copy master or OHP

Ps come out to choose a card and stick in appropriate set. Class agrees/ disagrees. Which is the biggest (smallest) number in each set?

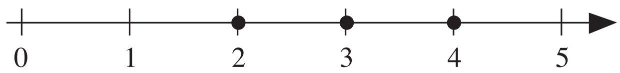
Let's mark the numbers on the number line. Ps come out to draw dots on first number line to show the whole numbers, then on 2nd number line to show fractions, then on 3rd number line to show whole numbers <u>and</u> fractions. Class agrees/disagrees.

Notes: At a good pace

Reasoning, agreement, praising

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

BB: a)



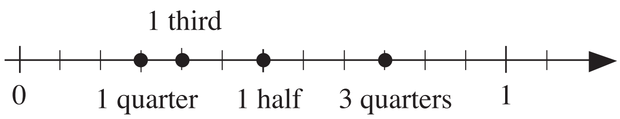
Notes: At a good pace

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)

Notes: Discussion, agreement

BB: $12 \div 3 = 4$ (parts)
$12 \div 4 = 3$ (parts)

BB: b)



Notes: Elicit that:

4 parts of 12 = 1 third
3 parts of 12 = 1 quarter
2 parts of 12 = 1 sixth
1 part of 12 = 1 twelfth

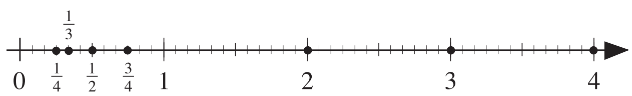
In part c):

- 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.

Notes: BB: $\frac{1}{4}$ $\frac{1}{3}$ $\frac{1}{2}$ $\frac{3}{4}$

T points to fraction at random and Ps read it in unison.

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.)

Notes: Agreement, praising

22 min

5

Fractions of a shape

Ps each have on desks a sheet of 4 cm by 6 cm rectangles.

Notes: Whole class discussion to start

What is each shape? (rectangle) What is its width (height)? (Ps measure with rulers. (6 cm, 4 cm) What is its area? (4 rows of 6 cm squares, i.e. 4 cm $\times$ 6 cm = 24 cm squares, or 24 cm^2, or 24 square cm)

Notes: Use copies of copy master for Ps and enlarged copy master or OHT for demonstration

How many cm squares are in 1 quarter of the area? ($24 \div 4 = \underline{6}$)

Find different ways to colour 1 quarter of the rectangle.

Notes: Individual work, monitored

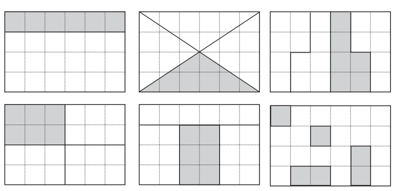
Set a time limit

Ps come out to BB to show different ways as they do them. Class points out if the area coloured is not a quarter. Praise creativity.

Notes: Reasoning, agreement, praising

BB:

e.g.



What part is <u>not</u> shaded? (3 quarters)

What <u>area</u> is not shaded? (18 cm squares or 18 cm^2)

Notes: Discussion on dividing into 4 <u>congruent</u> parts (i.e. same shape and size) or 4 parts with equal area (i.e. containing the same number of grid squares)

28 min

Bk3

Lesson Plan 50

Activity		Notes

6

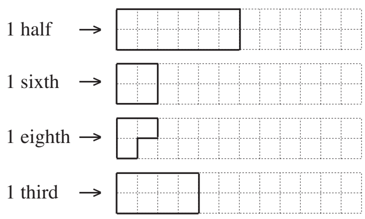
Book 3, page 50

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 *Pbs*. Review at BB with whole class. Mistakes corrected. What part is left? (half, 5 sixths, etc.)

Solution: e.g.



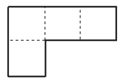
Notes: Individual work, minitored, helped

Drawn on BB or use enlarged copy master or OHP

Agreement, praising

Extra praise for creative solutions,

e.g. 1 sixth:



34 min

7

Book 3, page 50

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

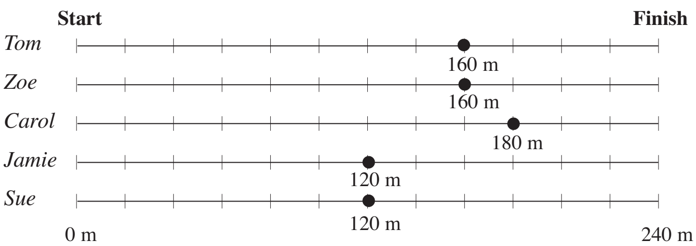
What are the names of the children in the race?

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: $240 \text{ m} \div 6 \times 4 = 40 \text{ m} \times 4 = \underline{160 \text{ m}}$ Let's write it below Tom's dot.

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

Solution:



Extension

How far away is each child from the finishing line?

Notes: Ps read problem silently first

T asks questions to test Ps' understanding

Discussion, agreement

BB: $240 \text{ m} \div 12 = 20 \text{ m}$

Do first part with whole class first

Diagram drawn on BB or use enlarged copy master or OHP

Reasoning, agreement, self-correcting, praising

T, Z: 240 m – 160 m = 80 m
C: 240 m – 180 m = 60 m
J, S: 240 m – 120 m = 120 m
(or use fractions: e.g.
T: $240 \text{ m} \div 6 \times 2 = 80 \text{ m}$)

40 min

8

Book 3, page 50

Q.3 Read: *Gerry spent £140 on his holiday.*
Joe spent 1 seventh more than Gerry.

a) How much money did Joe spend on his holiday?
b) How much money did Gerry and Joe spend altogether?

Review at BB with whole class. **D**, come and tell us how you worked out the answer. Who agrees? Who did it a different way? etc. Mistakes corrected.

BB: a) G: £140; J: £140 + £140 ÷ 7 = £140 + £20 = <u>£160</u>

b) G + J: £140 + £160 = £140 + £60 + £100 = <u>£300</u>

Notes: Individual work, monitored, helped

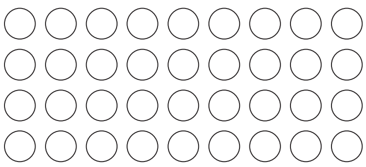
Make sure that Ps realise that Joe' amount is 1 seventh <u>more</u>, not just 1 seventh!

Reasoning, agreement, self-correction, praising

Answer:
a) Joe spent £160.
b) Gerry and Joe spent £300 altogether.

45 min

Bk3	R: Calculations **C: Practice: numbers, fractions, time** *E: Challenges and puzzles*	*Lesson Plan* *51*

Activity		*Notes*
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) $\overset{134}{\underline{56+78}}$ $\underline{56+70+8}$ $\overset{144}{56+8+80}$ $\underline{56+80-2}$ $\underline{56+8+70}$ $56+80+8$ $\underline{56-2+80}$ $56-2+90$ b) $\overset{29}{\underline{123-94}}$ $\underline{123-90-4}$ $\underline{123-3-90-1}$ $\underline{123-3-1-90}$ $\underline{123-4-90}$ $\underline{123-100+6}$ $123+4-100$ ^{27} $\underline{123+6-100}$ *6 min*	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.
2	**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. 9 eggs $\rightarrow$ 1 pie, 140 eggs $\rightarrow$ (140 ÷ 9) pies $140 \div 9 = (90+50) \div 9 = 90 \div 9 + 50 \div 9$ $= 10 + 5, \text{r } 5 = \underline{15}, \text{r } 5$ *Answer:* She could make 15 pies. 5 eggs will be left over. *14 min*	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
3	**Problem 2** The rabbit family are having dumplings for lunch. How many dumplings has *Mrs Rabbit* made? (36) BB:  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: $36 \div 6 = \underline{6}$) b) Jenny Rabbit ate 1 third of the dumplings. (BB: $36 \div 3 = \underline{12}$) c) Cilla Rabbit ate 1 quarter of the dumplings. (BB: $36 \div \underline{4} = \underline{9}$) d) Tim Rabbit ate 1 ninth of the dumplings. (BB: $36 \div 9 = \underline{4}$) 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: $6 + 12 + 9 + 4 = 31$, $36 - 31 = \underline{5}$ *20 min*	Whole class activity Drawn on BB or OHP or pictures of dumplings cut out and stuck to BB BB: $9 \times 4 = 36$ 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 aks questions if Ps cannot think of any. Agreement, praising

Bk3

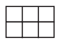
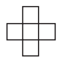
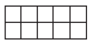
Lesson Plan 51

Activity		*Notes*
4	***Book 3, page 51*** 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 dicate numbers to T (or come to BB to write them in), explaining reasoning. Class agrees/disagrees. Mistakes corrected. *Solution:* a) **200** 123 **77** **65** 58 19 **18** 47 11 8 b) **200** 60 140 **20** **40** 100 0 **20** 20 **80** *25 min*	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
5	***Book 3, page 51*** 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 dicate numbers to T (or come to BB to write them in), explaining reasoning. Class agrees/disagrees. Mistakes corrected. *Solution:* a) **500** 10 **50** **2** 5 10 **2** 1 5 2 b) **120** **6** 20 3 **2** 10 3 1 2 **5** *30 min*	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
6	***Book 3, page 51, Q.3*** 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: $\boxed{\text{3 quarters of an hour}}$ = 45 minutes ii) Break: $\boxed{\text{1 quarter of an hour}}$ = 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 <u>4</u> 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 = <u>3 hours</u> ii) Time in breaks: 4 × 15 min = (4 × 10 + 4 × 5) min = (40 + 20) min = 60 min = <u>1 hour</u> Pupils spend 3 hours in lessons and 1 hour in breaks. *35 min*	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 *Pb*s 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 = <u>3 hours</u> ii) 4 × 1 quarter of an hour = 4 quarters of an hour = <u>1 hour</u> *Check:* 3 h + 1 h = 4 h

Bk3

Lesson Plan 51

Activity		*Notes*
7	***Book 3, page 51*** Q.4 Read: *Fill in the missing items.* Review at BB with whole class. Mistakes corrected. *Solution:* a) $100 \xrightarrow{\text{1 fifth}} \boxed{20} \xrightarrow{\text{1 half}} \boxed{10}$; 1 $\boxed{\text{tenth}}$ b) $100 \xrightarrow{\text{2 fifths}} \boxed{40} \xrightarrow{\text{1 half}} \boxed{20}$; $\boxed{1}$ fifth c) $200 \xrightarrow{\text{1 fifth}} \boxed{40} \xrightarrow{1\ \boxed{\text{half}}} 20$; 1 $\boxed{\text{tenth}}$ d) $100 \xrightarrow{\text{2 tenths}} \boxed{20} \xrightarrow{\text{1 half}} \boxed{10}$; $\boxed{1}$ tenth What do you notice about the diagrams? Discuss relationships and connections. *40 min*	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. $100 \div 5 \div 2 = 100 \div 10$
8	**What is missing?** Study the table. What do you think are the missing shapes? BB:	Whole class activity Table drawn on BB or use enlarged copy master or OHP

Unit						
Shape						
Value of shape	2 thirds	3 quarters	4	1 third	5	1 fifth

← added by Ps

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

Discussion, reasoning, agreement, praising

Feedback for T

Extension

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

Extra praise for creative suggestions

45 min

Bk3

R: Calculations

C: Practice: numbers, fractions, time

E: Problem solving. Puzzles

Lesson Plan 52

Activity		*Notes*

1

Mental practice

T asks a question. Ps say answers, explaing 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)

Notes:
Whole class activity
T chooses Ps at random
Reasoning, agreement
Calculations written on BB if necessary, e.g.
124 – 56 = 124 – 20 – 30 – 4 – 2
124 + 56 = 124 + 50 + 6
Praising, encourgaement only

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) $78 + 4 \times 8 = (78 + 32 = 110)$ $87 + 8 \times 4 = (87 + 32 = 119)$
$79 + 4 \times 8 = (79 + 32 = 111)$ $8 \times 3 + 87 = (24 + 87 = 111)$
$9 \times 3 + 78 = (27 + 78 = 105)$ $87 + 9 \times 4 = (87 + 36 = 123)$
$79 + 3 \times 8 = (79 + 24 = 103)$ $78 + 4 \times 4 = (78 + 16 = 94)$

Let's write the results in increasing order. T writes as dictated by Ps.
BB: $94 < 103 < 105 < 110 < 111 = 111 < 119 < 123$

b) $105 - 88 \div 4 = (105 - 22 = 83)$, $105 - 88 \div 8 = (105 - 11 = 94)$
$110 - 88 \div 4 = (110 - 22 = 88)$, $110 - 88 \div 8 = (110 - 11 = 99)$
$95 + 80 \div 4 = (95 + 20 = 115)$, $95 + 80 \div 8 = (95 + 10 = 105)$
$95 + 160 \div 8 = (95 + 20 = 115)$, $95 + 160 \div 4 = (95 + 40 = 135)$

Let's write the results in decreasing order. T writes as dictated by Ps.
BB: $135 > 115 = 115 > 105 > 99 > 94 > 88 > 83$

Notes:
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
etc.
If problems, show on class number line.
Ps list increasing/decreasing orders in *Ex. Bks* too.
Feedback for T

10 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. $\boxed{8}$ hours

b) She plays for 1 eighth of the day. $\boxed{3}$ hours

c) She is at school for 1 quarter of the day. $\boxed{6}$ hours

d) She visits friends for 1 sixth of the day. $\boxed{4}$ hours

e) She teases the cat for 1 twelfth of the day. $\boxed{2}$ hours

How long does she have left do do her homework?

BB: (8 + 3 + 6 + 4 + 2) hours = 23 hours; (24 – 23) hours = <u>1 hour</u>

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?

Extension

Ps work out in a similar way how they spend their time during a day.

Notes:
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

Bk3

Lesson Plan 52

Activity		*Notes*

4

Book 3, page 52

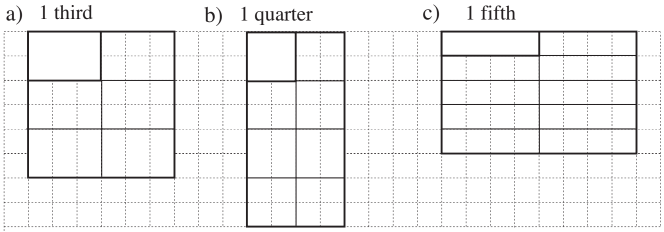
Q.1 Read: *Complete each given part to 2 whole units.*

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:

a) 1 third b) 1 quarter c) 1 fifth



2 = 6 thirds 2 = 8 quarters 2 = 10 fifths

Notes: Individual work, monitored, helped

Drawn on BB or use enlarged copy master or OHP

Discussion, reasoning, agreement, self-correction, praising

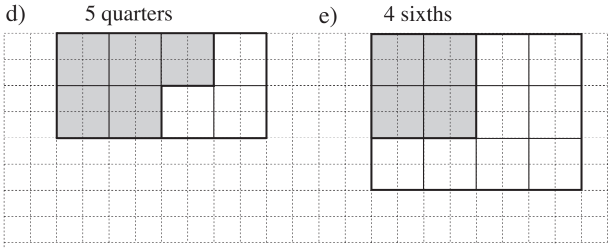
Elicit the value of the parts which had to be drawn.

(5 thirds, 7 quarters, 9 fifths)

Extension

Who can complete these parts to 2 whole units?

BB: d) 5 quarters e) 4 sixths



2 = 8 quarters 2 = 12 sixths

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

Notes: Whole class activity

Use enlarged copy master/OHP

Reasoning, agreement, praising

Elicit the value of the parts which had to be drawn.

(3 quarters, 8 sixths)

20 min

5

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:

							e.g.
Saved	**£10**	**£8**	**£2**	£1	£1.20	**£4.80**	£5.00
Spent	£2.50	£2	50 p	**25 p**	**30 p**	£1.20	£1.25
Had left	£7.50	£6	£1.50	75 p	90 p	£3.60	£3.75

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.

Notes: Whole class activity

Table drawn on BB or use enlarged copy master or OHP

At a good pace

Discussion, reasoning, agreement, praising

T helps with calculations, e.g.

£10 ÷ 4 = £8 ÷ 4 + £2 ÷ 4
= £2 + 200 p ÷ 4
= £2 + 50 p = £2.50

£1.20 ÷ 4 = 120 p ÷ 4 = 30 p

Demonstrate with real or model money if necessary

25 min

Bk3

Lesson Plan 52

Activity		Notes

6

Book 3, page 52, Q.2

Read: *How much of their money did they spend?*

T has model money stuck to (or drawn on) BB as in *Pb*. Ps come out to count up how much each person had, then to calculate the two fractions. Are they correct? Who would do it another way? etc.

Solution:

a) *Irene* had: $100 + 50 + 20 + 20 + 10 = 100 + 100 = 200$

spent: half of 200 $= 200 \div 2 = 100$,

1 fifth of 100 $= 100 \div 5 = \underline{20}$

b) *George* had: $3 \times 50 + 20 + 10 = 150 + 30 = 180$

spent: 1 third of 180 $= 180 \div 3 = 60$,

half of 60 $= 60 \div 2 = 30$

c) *Nick* had: $2 \times 100 + 2 \times 50 + 3 \times 20 = 200 + 100 + 60 = 360$

spent: half of 360 $= 360 \div 2 = 200 \div 2 + 160 \div 2$
$= 100 + 80 = 180$

1 third of 180 $= 180 \div 3 = \underline{60}$

d) *Jane* had: $50 + 4 \times 20 + 3 \times 10 = 50 + 80 + 30 = 160$

spent: 1 quarter of 160 $= 160 \div 4 = 40$,

1 eighth of 40 $= 40 \div 8 = \underline{5}$

(Or parts b) to d) done as individual work, monitored and reviewed)

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*

33 min

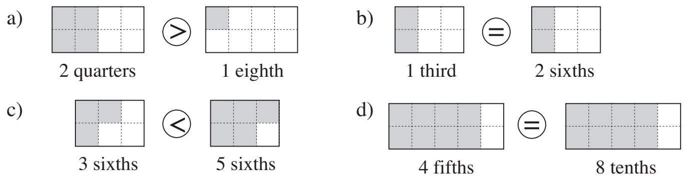
7

Book 3, page 52

Q.3 Read: *Colour the parts stated. Compare the two rectangles. Fill in the missing sign.*

Make sure Ps know that they should write <, > or = in the circles. Review at BB with whole class. Mistakes discussed and corrected.

Solution:



Notes:

Individual work, monitored, helped

Use enlarged copy master or OHP

Agreement, self-correction, praising

Feedback for T

39 min

8

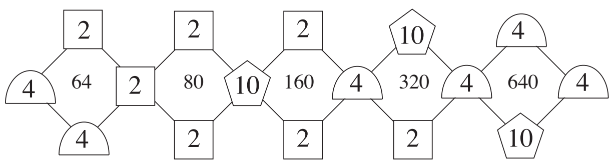
Book 3, page 52, Q.4

Read: *The middle number is the product of the 4 numbers around it. Fill in the missing numbers.*

Where should we start? (e.g. at 80 because it has 3 numbers the same)
What are two factors of 80? (e.g. 8×10) Elicit that $8 = 2 \times 2 \times 2$.
Ps come to BB to write '2' in all the squares and '10' in all the pentagons.

Continue in similar way with Ps suggesting what to do next.

Solution:



Notes:

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.

45 min

Bk3

R: Mental calculation
C: Extending numbers to 1000
E: Numbers to 2000

Lesson Plan 53

Activity		*Notes*
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.	Paired work, monitored, Ps have model money on desks (£1 and £2 coins and £5, £10 and £100 notes
	①①①①①①①①①① ①①①①① $\boxed{5}$ ①①①①①①①①② ①①①② $\boxed{5}$ ①①①①①①②② ①②② $\boxed{5}$ ①①①①②②② $\boxed{5}$ $\boxed{5}$ ①①②②②② $\boxed{10}$ ②②②②②	Set a time limit Discussion, agreement, praising
	b) Make £100 with £10 notes. Review as above. $\boxed{10}$ $\boxed{10}$ $\boxed{10}$ $\boxed{10}$ $\boxed{10}$ $\boxed{10}$ $\boxed{10}$ $\boxed{10}$ $\boxed{10}$ $\boxed{10}$	BB: 10 × £10 = 100
	c) Make £1000 with £100 notes. Review as above. $\boxed{100}$ $\boxed{100}$ $\boxed{100}$ $\boxed{100}$ $\boxed{100}$ $\boxed{100}$ $\boxed{100}$ $\boxed{100}$ $\boxed{100}$ $\boxed{100}$	Helped. T notes which Ps know what 1000 means.
	How many 100s did you use? (10)	BB: 10 × 100 = 1000
	Let's count them: '100, 200, 300, 400, 500, 600, 700, 800, 900, 1000'	In unison
	Let's put 10, 100 and 1000 in a place-value table. What does each heading stand for? (Thousands, Hundreds, Tens and Units)	Whole class activity Table drawn on BB

BB:

	Th	H	T	U	
10			1	0	1 ten, 0 units
100		1	0	0	1 hundred, 0 tens, 0 units
1000	1	0	0	0	1 thousand, 0 hundreds, 0 tens, 0 units

Ps come out to write digits in the correct columns. — *Notes:* Agreement, praising

6 min

2 **Hundreds, tens and units**

Ps each have on desks: 5 'hundred' squares, 10 'strips of 10' and 10 unit squares .

Notes: 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)

How many unit squares are in the large square? (10 × 10 = <u>100</u>)
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**.

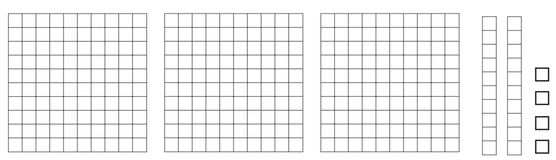
Notes: Individual work, monitored, helped

A, what did you use? Who agrees? Who did something different? T shows on BB too. Repeat for other numbers.

Notes: Agreement, praising. (Use magnets or blue-tack stuck to back of card)

BB:

324



Notes: Place-value table drawn on BB

BB:

	Th	H	T	U
324		3	2	4

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.

Notes: In unison. Agreement, praising

c) Ps write a number in the place value table and ask other Ps to say how many tens (hundreds, units).

Notes: Praising, encouragement only

12 min

Bk3

Lesson Plan 53

Activity		*Notes*

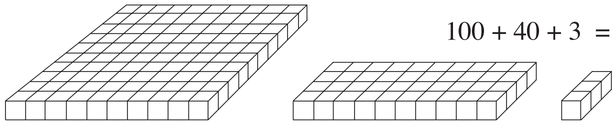
3

Unit cubes

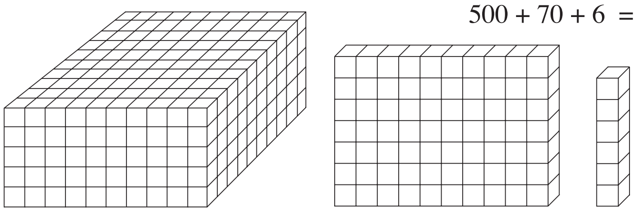
Which number is shown? Ps come to the BB to count the unit cubes in each row or layer.

BB:

a) 100 + 40 + 3 = <u>143</u>



b) 500 + 70 + 6 = <u>576</u>



How many unit cubes are there altogether?

BB: $100 + 500 + 40 + 70 + 3 + 6 = 600 + 110 + 9$
$= 600 + 100 + 10 + 9$
$= 700 + 19$
$= \underline{719}$

Notes: 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

16 min

4

Book 3, page 53

Q.1 Read: *How many small squares are in the drawing?*
Write the numbers in the table.

Elicit that in each large square there are (10 × 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.)

Extension

What do you notice? (13 units is enough to make 1whole 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 tht 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'

Notes: Individual work, monitored, helped

Use enlarged copy master or OHP

Discussion, reasoning, self-correcting, praising

BB:

	Th	H	T	U	
a)		8	3	6	1098 (a + b)
b)		2	6	2	1277 (b + c)
c)	1	0	1	5	
Total	1	10	10	13	↓
	2	1	1	3	

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

Bk3

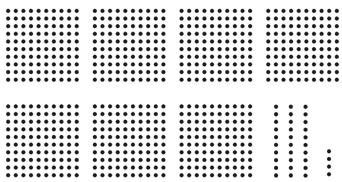
Lesson Plan 53

Activity		Notes

5 **Addition**

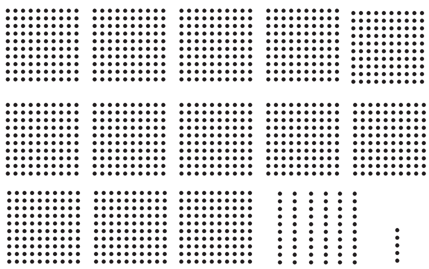
Look at these diagrams. What can you tell me about them?
(10 × 10 = 100 dots in large squares, 10 dots in each row or column)

BB: a)



	Th	H	T	U
a)				
b)				
Total				

b)



Deal with one part at a time. Ps write number on scrap paper and show on command. Ps who reponded 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:

	Th	H	T	U
a)		7	3	4
b)	1	3	6	5
Total	2	0	9	9
	1			

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

25 min

---

6 ***Book 3, page 53***

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, praisig

BB:

	Th	H	T	U
a)		6	9	2
b)	1	3	2	9
Total	2	0	2	1
	1	1	1	

30 min

---

7 **Mental practice**

a) T says , e.g. '4 times tens, P_1 says '4 times 10 equals 40';
T says '4 times 1 hundred', P_2 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

35 min

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8 ***Book 3, page 53***

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 < 562 < 605 < 651 < 920 < 999

Notes:

Individual work, monitored, (helped)

Agreement, self-correction, praising

Feedback for T

40 min

Bk3		*Lesson Plan 53*
Activity		***Notes***
9	***Book 3, page 53*** 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*	Individual work, monitored, (helped) (Ps can find several of the words needed in Q.3 in *Pbs*) Agreement, self-correction Praising, encouragement only

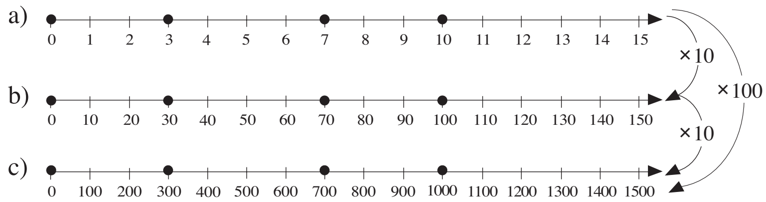
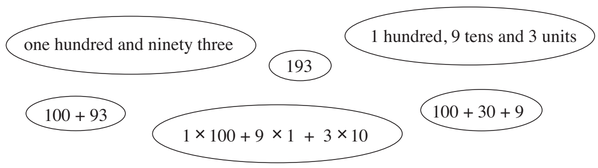
Bk3

R: Mental calculation

C: Extending numbers to 1000

E: Numbers up to 2000

Lesson Plan 54

Activity		*Notes*
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: $b = 10 \times a$, $c = 10 \times b$, $c = 100 \times a$ and, e.g. $0 \times 10 = 0$, $0 \times 100 = 0$ $3 \times 10 = 30$, $30 \times 10 = 300 = 3 \times 100$ $10 \times 10 = 100$, $100 \times 10 = 1000 = 10 \times 100$ *5 min*	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.
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, (Ps: 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, . . .) *10 min*	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
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:  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 $1 \times 100 + 9 \times 10 + 3 \times 1$ *14 min*	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
4 **Extension**	***Book 3, page 54*** 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 900 + 45 In what other ways can you make 945? *18 min*	Individual work, monitored Drawn on BB or use enlarged copy master or OHP Reasoning, agreement, self-correcting, praising Agreement, praising

Bk3

Lesson Plan 54

Activity		*Notes*

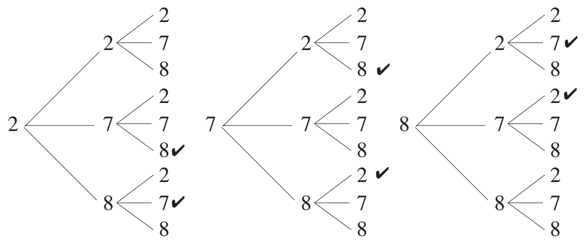
5

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:



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.

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: $3 \times 3 \times 3 = \underline{27}$ possible numbers

Ps come to BB and class keeps count

Agreement, praising

BB: $3 \times 2 \times 1 = \underline{6}$ possible numbers.

25 min

6

Book 3, page 54

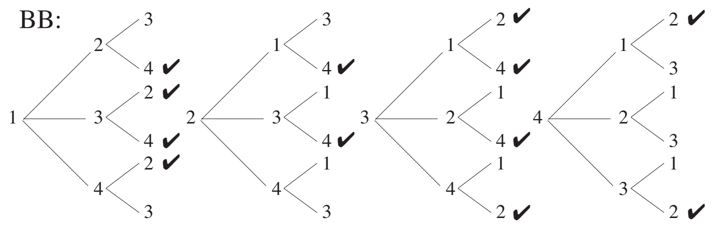
Q.2 Read: *Create as many different 3-digit numbers as you can from the digits 1, 2, 3 and 4.*

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:



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: $4 \times 3 \times 2 = \underline{24}$

Elicit that a 3-digit number is even if the <u>units</u> digit is even.

31 min

Bk3		*Lesson Plan 54*
Activity		***Notes***
7 **Extension**	**Numbers** a) How many 2-digit whole tens are there? (9) What are they? Ps: '10, 20, 30, 40, 50, 60, 70, 80, 90' 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' 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). 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. *35 min*	Whole class activity Agreement, praising Elicit that there are: a) 9 possible tens digits, with 0 as units digit (9×1) b) 1 as tens digit and 9 possible units digits (1×9) c) $9 \times 10 = \underline{90}$ d) $9 \times 10 \times 10 = \underline{900}$
8	***Book 3, page 54*** 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 *Solution:* a) $\underline{444}$ b) i) $200 + 10 + 4 = \underline{213}$ ii) $300 + 11 \times 10 + 5 = 300 + 110 + 5 = \underline{415}$ iii) $500 + 50 + 9 = \underline{559}$ iv) $400 + 12 = \underline{412}$ v) $300 + 30 + 3 = \underline{333}$ Let's list them in increasing order. T writes what Ps dictate. BB: $\underline{213} < \underline{333} < 412 < \underline{415} < \underline{559}$ Who can come and underline the odd numbers? Who agrees? *40 min*	Individual work, monitored, (helped) Drawn on BB or use enlarged copy master or OHP Discussion, reasoning, agreement, self-correcting, praising Feedback for T Whole class activity Elicit that a 3-digit number is odd if the units digit is odd.
9	**Which is more?** 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.) *45 min*	Whole class activity At a good pace BB: e.g. 3, 7, 2 $237 < 732$ two hundred and thirty seven seven hundred and thirty two Praising, encouragement only

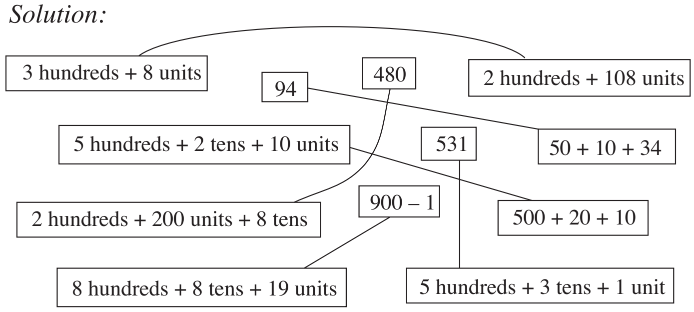
Bk3

R: Mental calculation

C: Counting, reading, writing and ordering numbers

E: Numbers up to 2000

Lesson Plan 55

Activity		*Notes*
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*	Whole class activity T chooses Ps at random At speed If a P makes a mistake,next P corrects it. Agreement, praising
2	***Book 3, page 55*** 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 squence. *9 min*	Individual work, monitored, (helped) Agreement, self-correcting, praising Orally at speed round the class
3	**Writing numbers** Write these numbers as digits in your *Ex. Bks*. a) i) six hundred and thirty five ii) nine hundred and twenty iii) 7 hundreds, 3 tens and 8 units iv) one thousand v) 2 hundred and ninety b) i) 909 ii) 405 iii) 450 iv) 613 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*	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
4 **Extension**	***Book 3, page 55*** 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:*  Let's put them in increasing order. T writes what Ps dicate or Ps come to BB to rearrange cards. *20 min*	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 < 531 < 899 Praising

Bk3

Lesson Plan 55

Activity		*Notes*

5

True or false?

Study these numbers.

340 1000 957 599
242 409 378

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!

i) e.g. 242 is even

ii) 4 even and 3 odd numbers

iv) 340, 1000 are whole tens: 34 tens and 100 tens)

v) 242 is less than 250

25 min

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:

A	1	2	3		5		7	8		10		12	13	14	15	16	17	18		20		22	23	24		26	
R	I	II		IV	V	VI			IX	X	XI				XV				XIX	XX	XXI						

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

30 min

7

Book 3, page 55

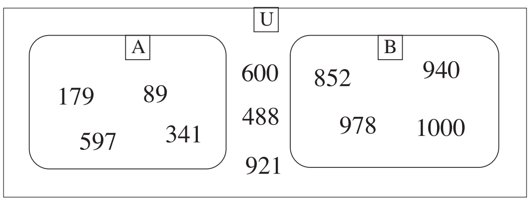
Q.3 Read: *Write the odd numbers smaller than 600 in set A.*
Write the even numbers greater than 800 in set B.
Choose from the numbers in set U.

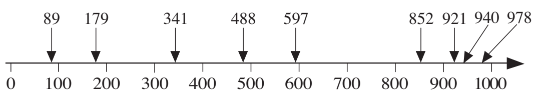
Ps write numbers in correct set, scoring each out from set U as it is dealt with. Discuss where to put numbers not in sets A or B.

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

35 min

Bk3		*Lesson Plan 55*

Activity		***Notes***

8

Book 3, page 55

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:

		Th	H	T	U
568	$5 \times 100 + 6 \times 10 + 8 \times 1$		5	6	8
173	$1 \times 100 + 7 \times 10 + 3 \times 1$		1	7	3
902	$9 \times 100 + 0 \times 10 + 2 \times 1$		9	0	2
430	$4 \times 100 + 3 \times 10 + 0 \times 1$		4	3	0
1245	$1 \times 1000 + 2 \times 100 + 4 \times 10 + 5 \times 1$	1	2	4	5
1050	$1 \times 1000 + 0 \times 100 + 5 \times 10 + 0 \times 1$	1	0	5	0

Notes:

Individual work, monitored, helped

Table drawn on BB or use enlarged copy master or OHP

T could ask P at BB to write number in words too.

Which is the biggest (smallest) number?

Class shouts out in unison: 1245 (173)

40 min

9

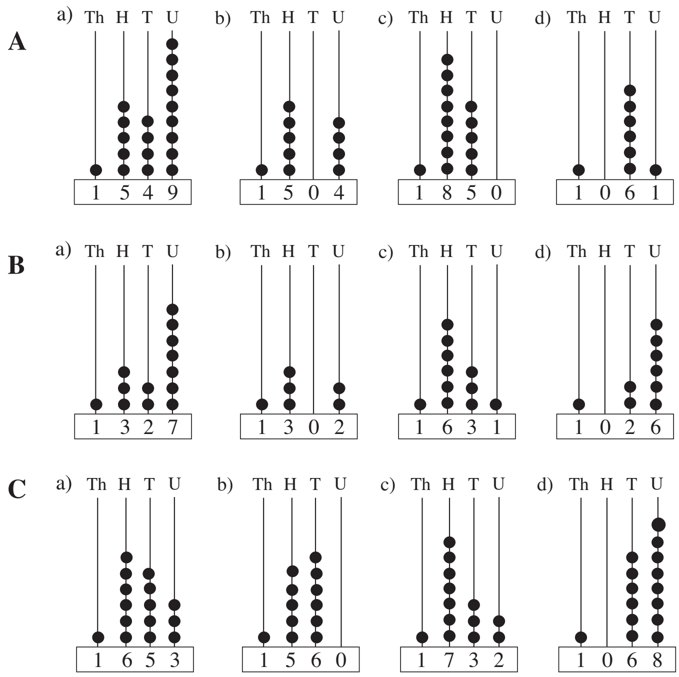
Abacus bingo

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: e.g.



Notes:

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)

45 min

Bk3

R: Mental calculation

C: Counting, reading and ordering numbers

E: Numbers up to 2000. Comparisons

Lesson Plan 56

Activity		*Notes*

1 **Sequences**

a) The first term is 700. Each following term is 100 more than the previous one. Let's say the terms up to 2000:

Ps: '700, 800, 900, 1000, 1100, 1200, 1300, 1400, . . ., 2000'

b) T says the first 3 terms of a sequence and Ps continue it.

2000, 1950, 1900, (1850, 1800, 1750, 1700, . . .)

What is the rule? (decreasing by 50)

Notes: Whole class activity

T chooses Ps at random

At speed

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

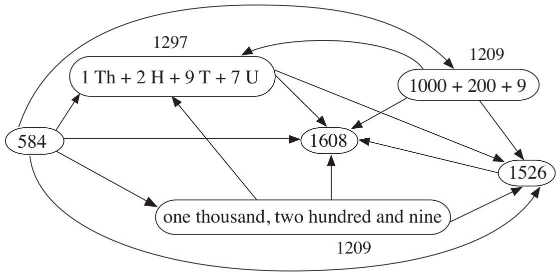
Agreement, praising

5 min

2 **Comparing numbers**

Let's compare these numbers. Which is more? Ps come out to BB to draw arrrows pointing towards the number which is greater.

BB:



Let's write them in increasing order. T writes what Ps dictate.

BB: 584 < 1209 = 1209 < 1297 < 1526 < 1608

Notes: Whole class activity

Numbers written on BB or use enlarged copy master or OHP (or cards cut from enlarged copy master and stuck to BB)

T helps with drawing the arrows.

Reasoning, agreement, praising

(There should be 14 arrows)

Agreement, praising

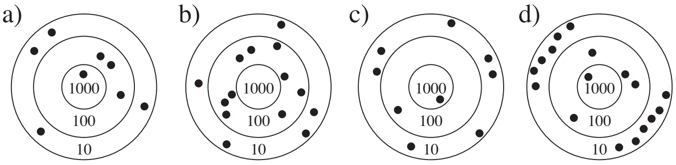
10 min

3 **Archery competition**

In an archery competition, these were the targets of the 4 competitors. What did they score? Who won the competition?

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.

BB: a) b) c) d)



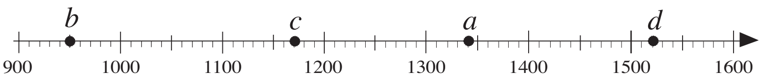
1340 950 1170 1520

Let's put the scores in decreasing order. T writes what Ps dictate.

$$\overset{d}{1520} > \overset{a}{1340} > \overset{c}{1170} > \overset{b}{950}$$

Which competitor is the winner? (d)

Let's mark each score on the number line. Ps come out to draw dots.



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.)

Notes: Whole class activity

Drawn on BB or use enlarged copy master or OHP

Make sure that all Ps know what archery is.

At a good pace

Reasoning, agreement, praising

If problems, write details on BB:

a) 1000 + 300 + 40 = 1340

b) 900 + 50 = 950

c) 1000 + 100 + 70 = 1170

d) 1000 + 500 + 20 = 1520

Agreement, praising

Discussion. Ask several Ps what they think.

Extra praise if Ps suggest it.

15 min

Bk3

Lesson Plan 56

Activity		*Notes*

4

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, 602, 1416, 1450, 1500, 1804, 1860, 2000} [written on one line if possible]

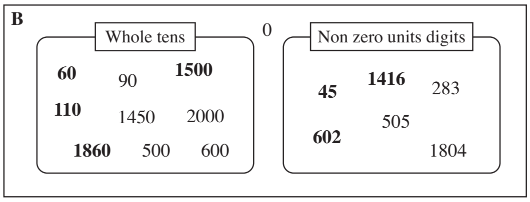
If we wanted to divide them up into two smaller sets (subsets), how could we do it? Ps suggest different ways.

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.

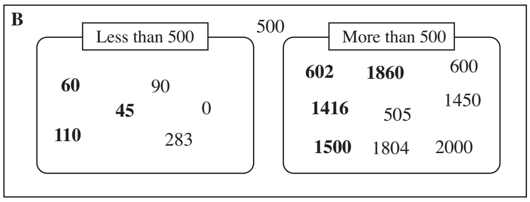
Ps come out to write in remaining numbers. Class agrees/disagrees.

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

Solution: a)



b)



Notes:

Whole class activity

BB already prepared

Discussion involving several Ps. Praise creativity.

Sets drawn on BB or use enlarged copy master or OHP

At a good pace. Ps underline (or other agreed mark) numbers as they are dealt with.

Discussion, reasoning, agreement, praising

Bold numbers already given

22 min

5

Book 3, page 56

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

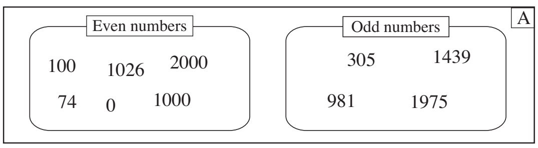
Deal with one part at a time. Decide on how to mark off the numbers as they are dealt with, e.g. underlining in part a), circling in part B, ticking in part c), or using colours.

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

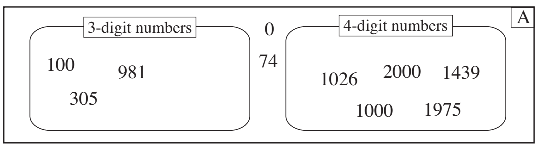
Discuss the cases of 0 and 74 in part b) and 1000 in part c).

Solution:

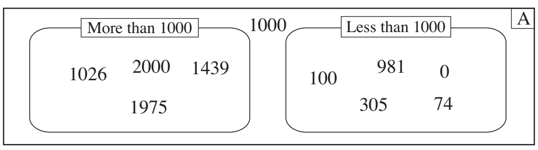
a)



b)



c)



Extension

Notes:

Individual work, monitored, helped

Numbers written on BB

(Or Ps could write set out again along each margin of *Pb*)

Discussion, reasoning, agreement, self-correction, praising

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

30 min

Bk3

Lesson Plan 56

Activity		Notes

6

Place value

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 ☐

Ps 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 ☐ 5.

Ps 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.

Ps write the number in their *Ex. Bks*. Review at BB with whole class. Mistakes corrected.

Notes:

Individual work in *Ex. Bks* but class kept together

T repeats descriptions slowly

Reasoning, agreement, self-correction, praising

BB:

a) 154 ☐

1541, 1543, 1545, 1547, 1549

b) 15 ☐ 5

1505, 1515, 1525, 1535, 1545

c) 1950

(Or Ps could show on scrap paper on command)

Feedback for T

35 min

7

Comparing numbers

Let's fill in the missing numbers and compare them. What signs could we choose from? (<. >, =)

BB:

a) 1 Th + 5 H + 9 U = 1509 > 1059 = 1 Th + 5 T + 9 U

b) 1 Th + 4 H + 6 T = 1460 > 1064 = 1 Th + 6 T + 4 U

c) 1 Th + 7 H + 5 U = 1705 < 1725 = 1 Th + 7 H + 2 T + 5 U

d) 1 Th + 6 H + 42 U = 1642 = 1642 = 1 Th + 64 T + 2 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.

Notes:

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

40 min

8

Book 3, page 56

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!.

Ps explain reason for choice. Class agrees on correct response.

Solution:

a)

A		B
111	+ 12 →	123
112	+ 12 →	124
113	+ 12 →	125
122	+ 12 →	134
123	+ 12 →	135
133	+ 12 →	145
222	+ 12 →	234
223	+ 12 →	235
233	+ 12 →	245
333	+ 12 →	345

b) i) False, e.g. 311 is missing

ii) True

iii) True

Notes:

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

45 min

Bk3

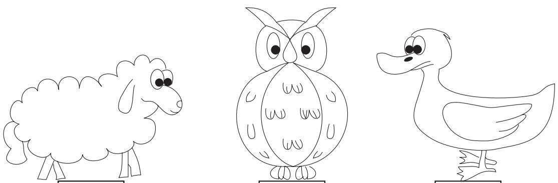
R: Mental calculation

C: Operations with whole tens and hundreds up to 1000

E: Numbers up to 2000

Lesson Plan 57

Activity		*Notes*
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, 820, 870, . . .) 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*	Whole class activity T chooses Ps at random At speed If a P makes a mistake, next P corrects it. Agreement, praising Ps might notice the pattern of endings in a) and b)
2	***Book 3, page 57*** 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*	Individual work, monitored, helped Drawn on BB or use enlarged copy master or OHP Discussion, agreement, self-correction, praising
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:*	Whole class activity Animals and cards enlarged and cut out from copy masters At a good pace Reasoning, agreement, praising



720	700	820
320 + 400	440 + 260	900 – 80
1000 – 280	900 – 200	650 + 170
900 – 180	180 + 520	750 + 70
600 + 120	840 – 140	960 – 140

Notes (Activity 3):

Write details of calculations on BB if necessary, e.g.

$750 + 70 = 750 + 50 + 20$
$= 800 + 20 = 820$

$900 - 180 = 900 - 100 - 80$
$= 800 - 80 = 720$

Feedback for T

Extension	Who can think of other operations for each animal? *15 min*	Orally or in *Ex. Bks*
4	***Book 3, page 57*** 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*	Individual work, monitored Initial discussion about task Differentiation by time limit Reasoning, agreement, self-correction, praising If problems, write details on BB Discuss all mistakes made Extra praise for excellent work

Bk3

Lesson Plan 57

Activity		*Notes*

5

Written exercises

T dicates an equation (e.g. '340 plus something is equal to 800'
Ps copy into *Ex. Bks* and solve it.

a) $340 + \boxed{460} = 800$ b) $920 - \boxed{520} = 400$

c) $\boxed{170} + 420 = 590$ d) $800 - \boxed{80} = 720$

e) $640 + \boxed{280} = 920$ f) $\boxed{760} - 320 = 440$

g) $390 + \boxed{30} = 420$ h) $300 - \boxed{60} = 240$

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

Notes:

Individual work in *Ex. Bks*, monitored, helped

T repeats each one

Ps nod heads to show when they are ready for teacher to move on.

T has BB or SB or OHT already prepared and uncovers each answer to confirm Ps' results.

Discussion on strategies for solution

Reasoning, agreement, self-correction, praising

6

Problem

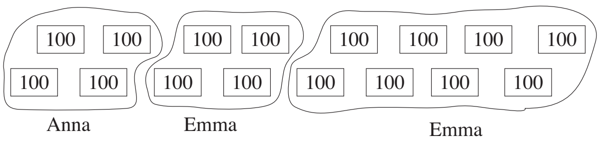
Listen carefully, picture the story in your head and think how you would solve it.

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:



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 ÷ 2 = £400
or (£1600 – £800) ÷ 2 = £800 ÷ 2 = £400
Anna: £400; Emma: £400 + £800 = £1200

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

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

30 min

Notes:

Whole class activity

Ps could have model money on desks.

Discussion on methods of solution. Involve several Ps.

Praise all contributions, but Ps copy method opposite into *Ex. Bks*.

Consolidate by Ps suggesting other contexts for similar problems.

Bk3		*Lesson Plan 57*
Activity		***Notes***
7	**Multiplication and division** T says a multiplication or division, Ps do calculation in *Ex. Bks*. Review with whole class. Mistakes discussed and corrected. Ps point out connections/relationships. a) $6 \times 3 = (18)$ $6 \times 30 = (180)$ $6 \times 300 = (1800)$ b) $16 \div 8 = (2)$ $160 \div 8 = (20)$ $1600 \div 8 = (200)$ c) $7 \times 8 = (56)$ $7 \times 80 = (560)$ $70 \times 8 = (560)$ d) $32 \div 4 = (8)$ $320 \div 8 = (80)$ $320 \div 40 = (8)$ *35 min*	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
8	***Book 3, page 57*** Q.3 Read: *Practise multiplication and division.* 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 them all correct? Who made a mistake? What was your mistake? Who did the same? Who does not understand what they did wrong? etc. *40 min*	Individual work, monitored Differentiation by time limit Reasoning, agreement, self-correction, praising Write details on BB if problems, e.g. $270 \div 90 = 27$ tens $\div 9$ tens $= 3$ tens $= 30$
9	***Book 3, page 57*** Q.4 Read: *Study the numbers in set A. Complete the sentences so that they are correct.* 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.) Ps complete sentences in *Pbs*. Review orally with whole class. Deal with all responses. Class agrees whether they are valid. *Solution:* e.g. a) All these numbers (are whole numbers). b) Not all these numbers (are 3-digit numbers). c) None of these numbers (are 1-digit numbers). d) There is at least one number which (is less than 100). *45 min*	Individual work, monitored, helped Initial whole class discussion Praise all contributions Reasoning, agreement, self-correcting, praising Many other responses possible Extra praise for creativity

Bk3

R: Mental calculation

C: Operations with whole tens and hundreds (up to 1000)

E: Numbers up to 2000

Lesson Plan 58

Activity		*Notes*

1 Chain operations

Which numbers do the letters stand for?

BB:

$$800 \xrightarrow{-40} \boxed{a} \xrightarrow{-80} \boxed{b} \xrightarrow{+110} \boxed{c} \xrightarrow{-70} \boxed{d} \xrightarrow{+280} \boxed{e}$$

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: $a = 800 - 40 = 760$ $\quad b = 760 - 80 = 680$

$c = 680 + 110 = 790$ $\quad d = 790 - 70 = 720$

$e = 720 + 280 = 1000$

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

5 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: $1000 - 280 + 70 - 110 + 80 + 40 = 800$

2 Puzzles

BB: a)

700			
140			
	60		
50			

b)

80				
170	320			
350	130	160		
140	190	150	100	
260	280	210	290	340

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. $260 + 140 + 350 + 170 + 80 = 1000$

$280 + 190 + 130 + 320 + 80 = 1000$

$210 + 190 + 350 + 170 + 80 = 1000$, etc.

10 min

Notes:

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

3 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:

☆	**340**	**120**	**160**	250	**380**	80	**90**	430	**170**
☼	**160**	**380**	340	**250**	120	**420**	410	**70**	330

Rule: ☆ + ☼ = 500, ☆ = 500 – ☼, ☼ = 500 – ☆

15 min

Notes:

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

Bk3

Lesson Plan 58

Activity		*Notes*

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:

70	80	90	100	110	120
20	10	30	30	10	20
100	40	50	40	50	60
110	120	60	90	80	70

Check:

$70 + 80 + 20 + 10 + 100 + 110 = 390$

$90 + 30 + 40 + 50 + 120 + 60 = 390$

$100 + 30 + 40 + 50 + 90 + 80 = 390$

$110 + 120 + 10 + 20 + 60 + 70 = 390$

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

Extension What is the value of the whole rectangle?

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

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 <u>value</u> are also 1 quarter of the <u>area</u> of the rectangle:

24 squares $\div$ 4 = 6 squares

Ps suggest how to calcuate it

Agreement, praising

20 min

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) $596 < 6\,\boxed{b}\,6$ — *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) $2\,\boxed{d}\,8 < 258$ — *d*: 4, 3, 2, 1, 0

e) $66\,\boxed{e} < \boxed{e}\,66$ — *e*: 7, 8, 9

f) $4\,\boxed{f}\,3 > 493$ — *f*: impossible

Notes:

Whole class activity

T has BB or SB or OHP already prepared

At a good pace

Discussion, reasoning, checking, agreement, praising

Class reads the inequalities in unison

Discuss how to make *f* possible (e.g. change > to <)

24 min

6

Book 3, page 58

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 $4 \times 5 = 20$ 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:

e.g. $1350 + 480 = 1350 + 400 + 80 = 1750 + 80$
$= 1750 + 50 + 30$
$= 1800 + 30 = 1830$

(or $1350 + 480 = 1330 + 500$
$= 1830$)

Solutions:

$26 + 13 = 39$	$260 + 130 = 390$	$58 - 32 = 26$	$580 - 320 = 260$
$18 + 42 = 60$	$180 + 420 = 600$	$70 - 21 = 49$	$700 - 210 = 490$
$56 + 44 = 100$	$560 + 440 = 1000$	$100 - 59 = 41$	$1000 - 590 = 410$
$135 + 48 = 183$	$1350 + 480 = 1830$	$146 - 18 = 128$	$1460 - 180 = 1280$
$164 + 36 = 200$	$1640 + 360 = 2000$	$200 - 35 = 165$	$2000 - 350 = 1650$

Notes:

Individual work, monitored, (helped)

Differentiation by time limit

Reasoning, agreement, self-correction, evaluation, praising

Ps explain how they did the calculations, e.g.

$1460 - 180 = 1480 - 200$
$= 1280$

etc.

30 min

Bk3

Lesson Plan 58

Activity		*Notes*

7

Book 3, page 58

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 × 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.

Notes: Individual work, monitored, (helped)
Differentiation by time limit
Reasoning, agreement, self-correction, evaluation, praising
Stars, stickers awarded for good work

35 min

8

Book 3, page 58, 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	280 + 340 + 380 = 1000 ✔
260 + 300 + ? is not possible	280 + 360 + ? is not possible
260 + 320 + ? is not possible	300 + 320 + 380 = 1000 ✔
260 + 340 + 400 = 1000 ✔	300 + 340 + 360 = 1000 ✔
260 + 360 + 380 = 1000 ✔	300 + 400 + ? is not possible
280 + 300 + ? is not possible	320 + 340 + ? is not possible
280 + 320 + 400 = 1000 ✔	320 + 360 + ? is not possible

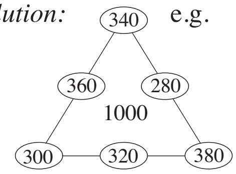
Elicit that only 6 sets of numbers are possible.

(N.B. Using algebra is too difficult at this stage.)

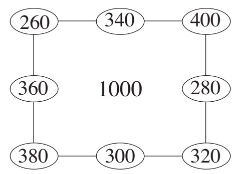
Notes: Whole class activity
Drawn on BB or use enlarged copy master or OHP
Discussion, reasoning, checking, agreement, praising
Paired work to arrange the possible sets of 3 numbers if Ps wish.

Solution: e.g.

a)



b)



40 min

9

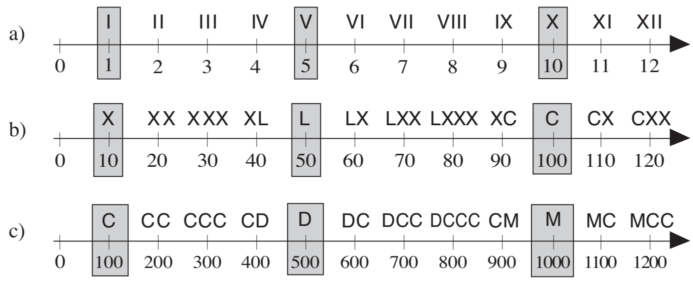
Book 3, page 58

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:



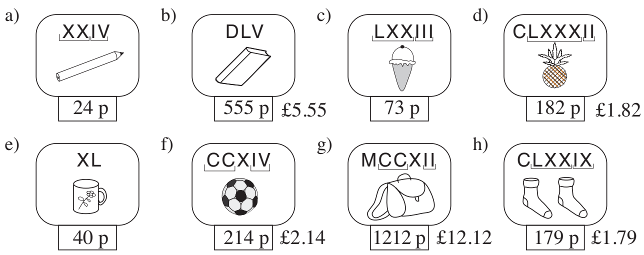
Notes: Individual work, monitored, helped
(Or whole class activity if short of time)
Use enlarged copy master or OHP
Discussion, agreement, self-correction, praising

(Less able Ps could use enlarged copy of copy master)

45 min

Bk3	R: Mental calculation **C: Roman numerals. Operations with whole tens and hundreds** *E: Numbers up to 2000*	*Lesson Plan 59*
Activity		***Notes***
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 70 = LXX 700 = DCC 8 = VIII 80 = LXXX 800 = DCCC 9 = IX 90 = XC 900 = CM *8 min*	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 <u>not</u> use: VV (5 + 5) for 10, or LL (50 + 50) for 100 Elicit that the smaller unit being subtracted is written <u>before</u> the larger unit and that the smaller unit being added is written <u>after</u> 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
2	**Practice with Roman numerals** T says a number and Ps come ut to BB to write in Roman numerals. Class points out errors. BB: e.g. <u>48</u> = 40 + 8 = $\underbrace{(50 – 10)}_{\text{XL}}$ + $\underbrace{(5 + 1 + 1 + 1)}_{\text{VIII}}$ = XLVIII <u>1999</u> = $\underbrace{1000}_{\text{M}}$ + $\underbrace{(1000 – 100)}_{\text{CM}}$ + $\underbrace{(100 – 10)}_{\text{XC}}$ + $\underbrace{(10 – 1)}_{\text{IX}}$ =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*	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).

Bk3 *Lesson Plan 59*

Activity		*Notes*
3	***Book 3, page 59*** 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 addtion. Mistakes corrected. *Solution:* a) $\underbrace{100}_{C} + \underbrace{(50 + 10)}_{LX} + \underbrace{(1 + 1)}_{II}$ = CLXII (162) b) $\underbrace{(500 + 100)}_{DC} + \underbrace{(50 - 10)}_{XL} + \underbrace{(1 + 1)}_{II}$ = DCXLII (642) c) $\underbrace{1000}_{M} + \underbrace{(500 + 100)}_{DC} + \underbrace{1}_{I}$ = MDCI (1601) d) $\underbrace{(1000 - 100)}_{CM} + \underbrace{(50 + 10)}_{LX} + \underbrace{5}_{V}$ = CMLXV (965) e) $\underbrace{1000}_{M} + \underbrace{(100 + 100)}_{CC} + \underbrace{(5 + 1)}_{VI}$ = MCCVI (1206) f) $\underbrace{(500 + 100 + 100)}_{DCC} + \underbrace{(10 + 10 + 10)}_{XXX}$ = DCCXXX (730) *20 min*	Individual trial, monitored, helped T has questions written on BB or SB or OHP Differentiation by time limit, or by set questions Ps who answered correctly explain to those who did not Reasoning, agreement, self-correction Praising, encouragement only
4	***Book 3, page 59*** 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:*  *26 min*	Individual work, monitored, helped Drawn on BB or use enlarged copy master or OHP Differentiation by time limit Discussion, reasoning, agreement, self-correcting, praising
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. BB: 356 CCCLVI; 204 CCIV; 713 DCCXIII; 825 DCCCXXV; 1001 MI; 968 CMLXVIII 179 CLXXIX; 407 CDVII; 652 DCLII; 936 CMXXXVI; 1053 MLIII; 1104 MCIV *32 min*	Whole class activity Numbers 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

Bk3

Lesson Plan 59

Activity		*Notes*
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) CCCXLVI = CCC + XL + VII = 300 + 40 + 7 = 347 b) DVIII = D + VIII = 500 + 8 = 508 c) CD = D – C = 500 – 100 = 400 d) MCMXLV = M + CM + XL + V = 1000 + 900 + 40 + 5 = 1945 e) DCCCLXXXVIII = DCCC + LXXX + VIII = 800 + 80 + 8 = 888 f) CMXI = CM + XI = 900 + 11 = 911 *35 min*	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	***Book 3, page 59*** Q.3 Read: *Write these numbers as Roman numerals.* T explains task using worked example. Ps first break down Arabic number in to hundreds, tens and units, then write Roman numeral below each part, then write complete Roman numeral at 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) $756 = \underbrace{(500 + 100 + 100)}_{\text{DCC}} + \underbrace{50}_{\text{L}} + \underbrace{(5 + 1)}_{\text{VI}} = \text{DCCLVI}$ b) $435 = \underbrace{(500 - 100)}_{\text{CD}} + \underbrace{(10 + 10 + 10)}_{\text{XXX}} + \underbrace{5}_{\text{V}} = \text{CDXXXV}$ c) $263 = \underbrace{(100 + 100)}_{\text{CC}} + \underbrace{(50 + 10)}_{\text{LX}} + \underbrace{(1 + 1 + 1)}_{\text{III}} = \text{CCLXIII}$ d) $974 = \underbrace{(1000 - 100)}_{\text{CM}} + \underbrace{(50 + 10 + 10)}_{\text{LXX}} + \underbrace{(5 - 1)}_{\text{IV}} = \text{CMLXXIV}$ *40 min*	Individual work, monitored, helped Discussion, agreement Reasoning, agreement, self-correcting Praising, encouragement only
8	***Book 3, page 59*** 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) $\text{CLIV} <_{\text{II}} \text{CLVI}$ $154 <_{2} 156$ b) $\text{DXXIX} <_{\text{III}} \text{DXXXII}$ $529 <_{3} 532$ c) $\text{M} \;{}^{\text{CXC}}\!> \text{DCCCX}$ $1000 \;{}^{190}\!> 810$ c) $\text{CCCL} \;{}^{\text{XXX}}\!> \text{CCCXX}$ $350 \;{}^{30}\!> 320$ *45 min*	Individual work, monitored, helped Discussion, agreement Reasoning, agreement, self-correcting Check with Arabic numbers Praising, encouragement only (Or done on BB with whole class)

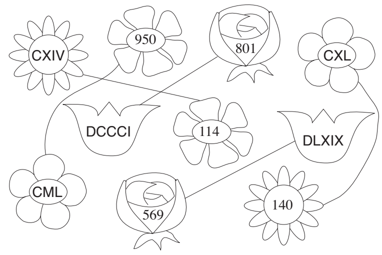
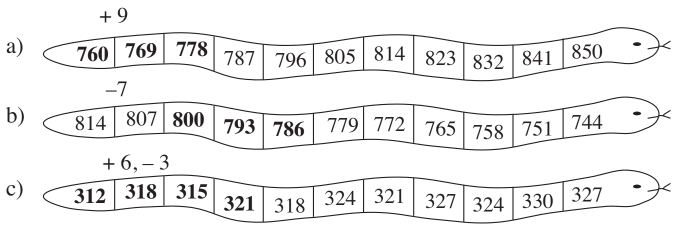
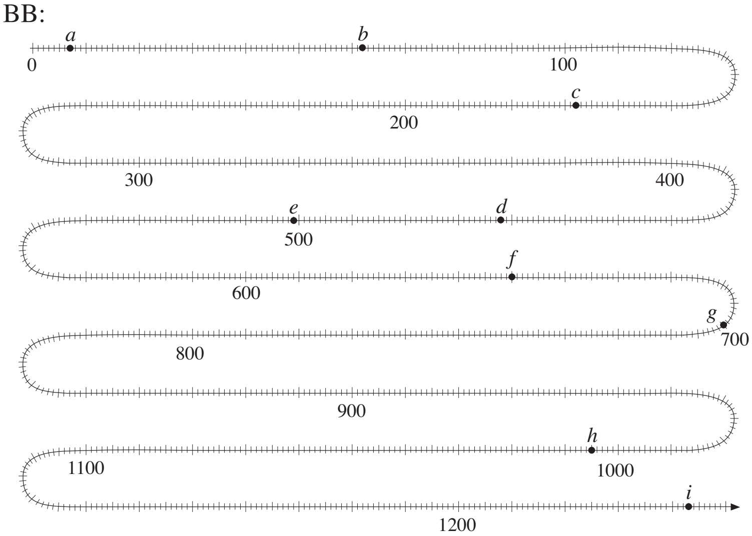
Bk3

R: Mental calculation

C: Number lines. Number sequences

E: Numbers up to 2000

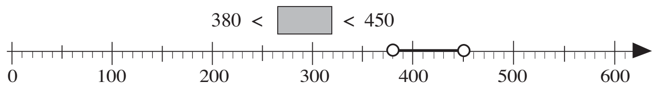
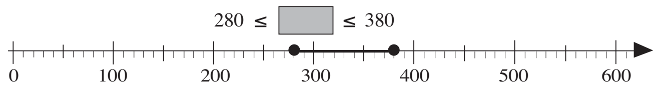
Lesson Plan
60

Activity		*Notes*
1	**Equal values** BB: Let's join up the equal values. Ps come out to BB to join up the flowers, explaining reasoning. Class points out errors.  *5 min*	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** Let's fill in the numbers on the snakes. Ps come out to fill in the missing numbers, explaining reasoning.. Class agrees/disagrees. Who can tell us the rule? Who agrees? Who thinks something else? etc. BB:  *10 min*	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** What can you tell me about this number line? (curved, starts at zero and goes up to 1250; the small ticks show the whole numbers, the medium ticks show 5 units and the large ticks show the whole tens) BB:  Which numbers do the letters stand for? Ps come out to choose a letter and write and say the number marked. Class agrees/disagrees. Let's write the numbers in decreasing order. T writes what Ps dictate, or Ps come out to write on BB. BB: 1243 > 1005 > 700 > 650 > 501 > 462 > 168 > 62 > 7 What other numbers could we find? Ps suggest numbers and choose Ps to show on number line. Class agrees/disagrees. (e.g. 72, 172, 572, 1072; 5, 205, 505, 905; etc.) *20 min*	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:* a = 7 b = 62 c = 168 d = 462 e = 501 f = 650 g = 700 h = 1005 i = 1243 Praising, encouragement only

Bk3		*Lesson Plan 60*
Activity		***Notes***
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, ... *25 min*	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	***Book 3, page 60*** 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) $a = 60$, $b = 160$, $c = 340$, $d = 480$, $e = 560$ *30 min*	Individual work, monitored, helped Drawn on BB or use enlarged copy master or OHP Agreement, self-correction, praising
6	***Book 3, page 60*** 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:* $a = 460$, $b = 600$, $c = 850$, $d = 972$, $e = 510$, $f = 605$, $g = 798$, $h = 975$, $i = 1420$, $j = 1600$, $k = 1703$ *35 min*	Individual work, monitored, helped Use enlarged copy master or OHP Discussion, agreement Reasoning, agreement, self-correcting, praising Feedback for T

Bk3

Lesson Plan 60

Activity		Notes
7	***Book 3, page 60***	
	Q.3 Read: *Which whole numbers make the statement true? Mark them on the number line. Write down the highest and lowest possible numbers.*	Individual trial, monitored helped
	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.	Drawn on BB or use enlarged copy master or OHP
	Review at BB with whole class. Mistakes corrected.	(If majority of Ps are struggling, change to whole class activity)
	Solution: a) $\square$: 381 to 449 b) $\square$: 280 to 380	Discussion, reasoning, agreement, self correction, praising
Extension	T shows how to mark an inequality on the number line to show <u>all</u> possible numbers (including fractions), not just whole numbers.	Explanation, demonstration
	a) If the LH (RH) number in an inequality is <u>not</u> a possible number, draw a *white* circle above it. Then join up the two circles. The line covers all possible numbers, but does <u>not</u> include the number on either side of the inequality. 	Consolidate by Ps marking another similar inequality. e.g. $10 < \square < 100$ and $520 \leq \square \leq 600$
	b) If the LH (RH) number in an inequality <u>is</u> 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. 	
	40 min	
8	***Book 3, page 60***	
	Q.4 Read: *Continue the sequences.*	Individual work, monitored, helped
	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.	Differentiation by time limit
	Review with whole class. Ps say their terms and give the rule. Who agrees? Who used a different rule? etc.	Discussion, reasoning, agreement, praising. Accept any valid rule. If Ps do not know the rule, T explains.
	Solution:	For T:
	a) 1, 2, 4, 8, 16, (32, 64, 128, 256, 512, 1024, 2048, . . .) *Rule:* Each following term is 2 × the previous term	a) geometric sequence: $a_n = 2^{n-1},\ n = 1, 2, 3, \ldots$
	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 × 1, 2 × 2, 3 × 3, 4 × 4, etc.)	b) Square numbers: $a_n = n^2,\ n = 1, 2, 3, \ldots$
	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.	c) Fibonacci sequence
	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.	d) $a_n = \dfrac{n(n+1)}{2}$
	45 min	

Bk3	R: Mental calculation **C: Rounding to tens and hundreds** *E: Numbers up to 2000*	*Lesson Plan 61*

Activity		*Notes*
1	**Making 3-digit numbers** Let's see how many different 3-digit numbers you can make from these number cards: BB: $\boxed{8}$ $\boxed{6}$ $\boxed{3}$	Whole class activity Paired work in finding the numbers Encourage logical order.
	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	Agreement, praising
	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)	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)
	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: $\underline{860} < 863 < 870$ $\underline{680} < 683 < 690$ $380 < 386 < \underline{390}$ $830 < 836 < \underline{840}$ $630 < 638 < \underline{640}$ $360 < 368 < \underline{370}$	Whole class activity T has BB or SB or OHT already prepared Rest of class write in *Ex. Bks.* too
	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.	At a good pace Reasoning, agreement, praising BB: rounded
	I will say a number and you round it to the nearest whole ten, e.g. 354 ($\approx$ 350, to the nearest 10), 687 ($\approx$ 690, to the nearest 10), 670 (= 670, to the nearest 10), 635 ($\approx$ 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.	T chooses Ps at random Agreement, praising BB: 635 $\approx$ 640, to nearest 10
	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: $800 < 863 < \underline{900}$ $600 < 683 < \underline{700}$ $300 < 386 < \underline{400}$ $\underline{800} < 836 < 900$ $\underline{600} < 638 < 700$ $300 < 368 < \underline{400}$	Rest of class write in *Ex. Bks.* too At a good pace Reasoning, agreement, praising
	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 ($\approx$ 500, to the nearest 100), 612 ($\approx$ 600, to the nearest 100), 500 (= 500, to the nearest 100), 249 ($\approx$ 200, to the nearest 100),	T chooses Ps at random Agreement, praising Agree that, e.g. 600 rounded to the nearest hundred is 600.
	How do you think we would round 350 to the nearest hundred? Agreement that such numbers are rounded up to the next hundred.	Ask several Ps what they think. BB: 350 $\approx$ 400, to nearest 100
	15 min	

Bk3

Lesson Plan 61

Activity		Notes

3 **Number line**

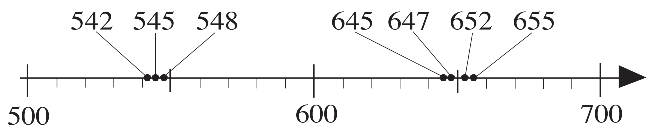
a) Let's find the approximate place of these numbers on the number line.

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:



Notes: Individual work in *Ex. Bks*, but class kept together

Discussion, agreement, demonstration on BB

T and Ps use rulers to draw straight lines and mark ticks.

Individual work in drawing dots and labelling, monitored, helped

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) $\underline{540} < 542 < 550$ $540 < 545 < \underline{550}$ $540 < 548 < \underline{550}$
$\underline{500} < 542 < 600$ $\underline{500} < 545 < 600$ $\underline{500} < 548 < 600$

ii) $640 < 645 < \underline{650}$ $640 < 647 < \underline{650}$ $\underline{650} < 652 < 660$
$\underline{600} < 645 < 700$ $\underline{600} < 647 < 700$ $\underline{600} < 652 < \underline{700}$

$650 < 655 < \underline{660}$
$600 < 655 < \underline{700}$

Notes: Individual work, monitored, helped

T could do first number on BB as a model and reminder.

Differentiation by time limit

Agreement, self-correction, praising

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) $542 \approx 540$, to nearest 10; $542 \approx 500$, 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.

Notes: Whole class activity

At a good pace

Encourage Ps to say the whole statement, e.g.

'542 is approximately (roughly) equal to 540, to the nearest 10'

25 min

4 ***Book 3, page 61***

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.

Notes: Individual work. monitored, helped

Differentiation by time limit

Discussion, reasoning, agreement, self-correction

Praising, encouragement only

(Only if some Ps have listed negative numbers)

30 min

Bk3

Lesson Plan 61

Activity | **Notes**

5

Book 3, page 61

Q.2 Read: *Mark on the number line the numbers which have these numbers as their nearest whole hundred: a) 500, b) 1000.*

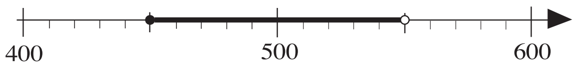
What is different about this question? (Asks for numbers, not whole numbers, so fractions can be included.) What will happen if we draw a dot at every possible number and fraction? (They will all join together to form a line.)

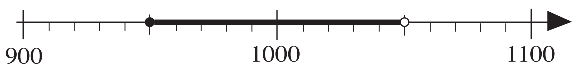
Who remembers how we can show all possible numbers, including fractions? (Write an inequality, draw circles at the lowest and greatest numbers, then join circles with a thick line.) T reminds Ps about drawing a black circle if the number is to be included in the list of possible numbers and a white circle if not.

(Do part a) with whole class first if Ps have forgotten.)

Review at BB with whole class. Mistakes corrected

Solution:

a) 

b) 

35 min

Notes:

Individual work, monitored, helped

(or whole class activity if T thinks it is necessary)

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

Give Ps the chance to explain if they can, otherwise T revises the notation.

Discussion on which numbers should be included and which should not.

a) $450 \leq \square < 550$

b) $950 \leq \square < 1050$

Reasoning, agreement, self-correction, praising

Feedback for T

6

Book 3, page 61

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)

40 min

Notes:

Individual work, but class kept together

Ps could show responses on command, either with agreed hand signs or wirtten on scrap paper.

Discussion, reasoning, agreement, self-correction, praising

Consolidate with similar examples if necessary.

Give Ps the chance to explain why both answers could be possible, otherwise T explains.

7

Book 3, page 61

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 <u>units</u> (5 rounds <u>up</u> to next 10)
- hundred they should look at the <u>tens</u> (50 rounds <u>up</u> to next 100)

Review orally round class. Mistakes corrected Show on number line if there are problems.

45 min

Notes:

Individual work, monitored (helped)

Discussion, reasoning, self-correction, praising

a) $138 \approx 140$, $577 \approx 580$
$1405 \approx 1410$, etc

b) $992 \approx 1000$, $135 \approx 100$
$1408 \approx 1400$, etc.

Bk3

R: Mental calculation

C: Rounding

E: Numbers up to 2000

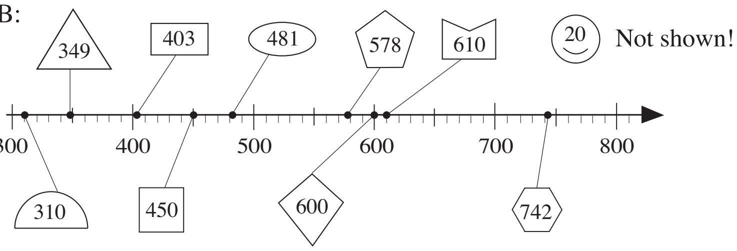
Lesson Plan 62

Activity		*Notes*

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:



5 min

Notes:
Whole class activity
Drawn on BB or use enlarged copy master or OHP
At a good pace
Agreement, praising
Discuss the case of 20, which cannot be shown on this segment of the number line.
Feedback for T
Ps tell the class the names of the shapes they know.

2 Rounding 1

Let's round these numbers to the nearest 10 and then to the nearest 100.

BB:

Number	Rounded to nearest 10	Rounded to nearest 100
349	350	300
403	400	400
481	480	500
578	580	600
610	610	600
310	310	300
450	450	500
600	600	600
742	740	700

(But note that $350 \approx 400$, to the nearest 100)

Ps come out to choose a number and fill in the appropriate columns. Class points out errors. Discuss the case of 349, which is rounded up to 350 to the nearest 10, but rounded down to 300 to the nearest 100.

10 min

Notes:
Whole class activity
Table drawn on BB or use enlarged copy master or OHP
Discuss the conventions of rounding as appropriate.
[Point out that numbers such as 349 cannot be rounded up to 350 to the nearest 10 and then rounded up again to 400 to the nearest 100, because 349 is nearer 300 than 400.]
At a good pace
Reasoning, agreement, praising
Feedback for T

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?

15 min

Notes:
Whole class activity
T could have a picture or drawing of *Donald Duck* stuck to BB (or use any cartoon character for motivation)
At a good pace
Reasoning, agreement, praising
Refer to number line if there are problems.
T points to each of other numbers in turn and class shouts out rounded value.

Bk3

Lesson Plan 62

Activity		*Notes*

4

Number line

Let's see if you can mark these numbers on the number lines.

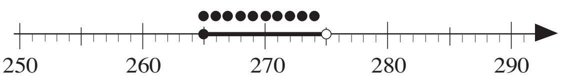
a) *Whole numbers which can be rounded to 270 to the nearest 10.*

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.

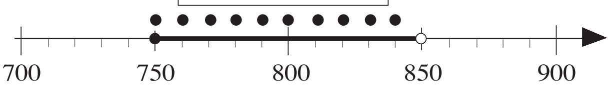
BB: a) $\boxed{265 \leq x < 275}$



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: b) $\boxed{750 \leq x < 850}$



20 min

Notes:

Whole class activity

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

Discussion, reasoning, agreement, praising

BB:

a) Let x be any possible number, then

$x \approx 270$, to nearest 10

$265 \leq x < 275$

Discussion, reasoning, agreement, praising

BB:

b) Let x be any possible number, then

$x \approx 800$, to nearest 100

$750 \leq x < 850$

5

Oral practice

Tell me the <u>even</u> 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!)

25 min

Notes:

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

Book 3, page 62

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, 501, 503, 504

30 min

Notes:

Individual work, monitored, helped

(or whole class activity if T thinks best)

Ps may use number line on *page 76, Q.2a* to help them.

Discussion at BB, reasoning, agreement, self-correction, praising

Feedback for T

Bk3

Lesson Plan 62

Activity		*Notes*

7

Book 3, page 62

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)

$\boxed{a}56$	$\boxed{b}64$	$3\boxed{c}5$	$3\boxed{d}3$	$35\boxed{e}$	$36\boxed{f}$
3	3	5	6	5, 6, 7, 8, 9	0, 1, 2, 3, 4

b)

$\boxed{g}50$	$\boxed{h}49$	$3\boxed{i}1$	$4\boxed{j}9$	$35\boxed{k}$	$44\boxed{l}$
3	4	5, 6, 7, 8, 9	0, 1, 2, 3, 4	0,1,2,3,4, 5,6,7,8,9	0,1,2,3,4, 5,6,7,8,9

Notes: 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

35 min

8

Book 3, page 62

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
$1006 \approx 1010$	$1006 \approx 1000$
$1005 \approx 1010$	$1005 \approx 1000$
$1001 \approx 1000$	$1001 \approx 1000$
$1753 \approx 1750$	$1753 \approx 1800$
$1759 \approx 1760$	$1759 \approx 1800$
$1750 \approx 1750$	$1750 \approx 1800$

Notes: Individual work, monitored, helped

T has numbers already written on BB, SB or OHP and uncovers each as it is dealt with.

Discussion, reasoning, agreement, self-correction, praising only

Stars, stickers, etc. awarded for excellent work.

Feedback for T

40 min

9

Book 3, page 62, Q.4

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 greatest possible 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.)

Notes: 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

45 min

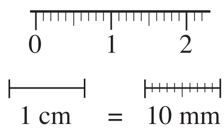
Bk3

R: Numbers up to 1000

C: Measuring length in cm and mm

E: Numbers up to 2000. Decimal notation.

Lesson Plan 63

Activity		*Notes*
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 metre (m), centimetre (cm), millimetre (mm) 1 m = 100 cm = 1000 mm 1 cm = 1 hundredth of a metre = 10 mm 1 mm = 1 thousandth of a metre = 1 tenth of a cm T underlines relevant Latin derivatives and elicits (or tells) that 'centi' means '1 hundredth' and 'milli' means '1 thousandth'. *10 min*	Whole class activity (Or any small objects which are not an exact number of cm long) Individual work in measuring Agreement, praising BB:  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.
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*	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.

Bk3		*Lesson Plan 63*
Activity		***Notes***
3	***Book 3, page 63, 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 → <u>50 m</u> 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 → <u>65 m</u> c) G to L: Length: 45 mm = 4 and a half cm Length in real life: 4 and a half cm → <u>45 m</u> 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 → <u>70 m</u> 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 <u>mm</u> in the diagrams, so the scale could also be written in another way. (BB)	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 → <u>50 m</u> Individual work, monitored, helped (or continue as whole class activity if Ps do not under-stand) Discussion, agreement, praising if a P notices BB: Scale: 1 mm → 1 m
Extension	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 <u>decimal</u>. The dot is called the <u>decimal point</u>. How could we show these two decimals in the place value table? Ps suggest to T what to write.	Some Ps might already know about decimals in the context of money. BB: 65 mm = 6.5 cm 45 mm = 4.5 cm <u>Decimal</u> <u>decimal point</u> BB:

Tens	Units	tenths
	6	5
	4	5

25 min

Bk3		*Lesson Plan 63*
Activity		***Notes***
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. *30 min*	Whole class activity Written on BB or SB 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	***Book 3, page 63*** 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 = <u>20</u> mm, 11 cm = <u>110</u> mm, 105 cm = <u>1050</u> mm ✔ b) 5 cm = <u>50</u> mm, 20 cm = <u>200</u> mm, 132 cm = <u>1320</u> mm ✔ c) 9 and a half cm = <u>95</u> mm, 57 and a half cm = <u>575</u> mm, 123 and a half cm = <u>1235</u> 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. *35 min*	Individual work, monitored, helped Written on BB or OHP Reasoning, agreement, self-correction, praising Whole class activity Praising, encouragement only In good humour!
6 **Extension**	***Book 3, page 63*** 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 = <u>2</u> cm <u>5</u> mm b) 2 m = <u>200</u> cm <u>0</u> mm 125 mm = <u>12</u> cm <u>5</u> mm 2 and a half m = <u>250</u> cm 82 mm = <u>8</u> cm <u>2</u> mm 12 m = <u>1200</u> cm 382 mm = <u>38</u> cm <u>2</u> mm 642 cm = <u>6</u> m <u>42</u> 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). *40 min*	Individual work, monitored, helped Written on BB or SB or OHP 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)

Bk3		*Lesson Plan 63*
Activity		***Notes***
7	**Rounding lengths**	Whole class activity

a) How can we round 423 mm to the nearest cm? T shows one method (with help of Ps). Elicit that:

BB: 423 mm = 42 cm 3 mm [1 cm = 10 mm]

and that 42 cm 3 mm is more than 42 cm and less than 43 cm.

BB: $\underline{42\text{ cm}} \underset{+\,3\text{ mm}}{<} 42\text{ cm }3\text{ mm} \underset{+\,7\text{ mm}}{<} 43\text{ cm}$

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?

BB: 423 mm $\approx$ <u>42</u> cm, 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, $30\text{ cm} \underset{+\,5\text{ mm}}{<} 30\text{ cm }5\text{ mm} \underset{+\,5\text{ mm}}{<} \underline{31\text{ cm}}$

305 mm $\approx$ <u>31</u> cm, to nearest cm

c) BB: 997 mm = 99 cm 7 mm, $99\text{ cm} \underset{+\,7\text{ mm}}{<} 99\text{ cm }7\text{ mm} \underset{+\,3\text{ mm}}{<} \underline{100\text{ cm}}$

997 mm $\approx$ <u>100</u> cm, to nearest 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

BB: 42.3 cm $\approx$ <u>42</u> cm, to nearest cm

b) 305 mm = 30.5 cm, so 30.5 cm $\approx$ <u>31</u> cm, to nearest cm

c) 997 mm = 99.7 cm, so 99.7 cm $\approx$ <u>100</u> cm, to nearest cm

45 min

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 <u>up</u> 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.

Bk3

R: Mental calculation

C: Measurement: changing units, rounding

E: Numbers up to 2000. Decimal notation.

Lesson Plan 64

Activity

Notes

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:

a) 3 m 25 cm (325 cm) = 3.25 m (325 cm) (3 m < 3.25 m < 4 m)

b) 4.15 m (415 cm) < 5 m (500 cm) 85 cm (4 m < 4.15 m < 5 m)

c) 5.55 m (555 cm) = 5 m 55 cm (555 cm) (5 m < 5.55 m < 6 m)

d) 7 m (700 cm) > 6.45 m (645 cm) 55 cm (6 m < 6.45 m < 7 m)

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

	H	T	U	t	h
a)			3	2	5
b)			4	1	5
c)			5	5	5
d)			6	4	5

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

5 min

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 + $\boxed{100}$ cm — *Check:*

1.25 m + $\boxed{75}$ cm — (125 cm + 75 cm = 200 cm)

$\boxed{53}$ cm + 1.47 m — (53 cm + 147 cm = 200 cm)

1.58 m + $\boxed{42}$ cm — (158 cm + 42 cm = 200 cm)

$\boxed{85}$ cm + 1.15 m — (85 cm + 115 cm = 200 cm)

1.85 m + $\boxed{15}$ cm — (185 cm + 15 cm = 200 cm)

Notes:

Whole class activity

Written on BB or use enlarged copy master or OHP

Agree that missing value can be found by subtractiing given value from 200 cm, e.g.

200 cm – 125 cm = 75 cm

Reasoning, checking, agreement, praising

Feedback for T

10 min

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)

Notes:

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

14 min

4

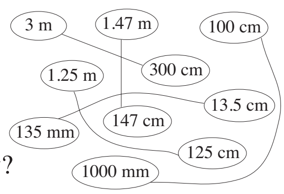
Equal values

Let's join up the equal values.

Ps come to BB to join up, explaining reasoning. Class agrees/disagrees.

Which lengths could be written another way?

BB:



Notes:

Whole class activity

Written on BB or use enlarged copy master or OHP

Reasoning, agreement, praising

e.g. 147 cm = 1 m 47 cm

18 min

Bk3		*Lesson Plan 64*
Activity		***Notes***
5	**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 *C* *A* *B* *D* 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 > <u>0.95 m</u> 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 *22 min*	Whole class activity (T could have large pictures or drawings of insects if possible for motivation) Reasoning, agreement, praising Class shouts out in unison At a good pace. Agreement, praising Class shouts out in unison Feedback for T (T might need to help explain the last value)
6	**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.) *25 min*	Whole class activity T chooses pairs of Ps to estimate, then a 3rd P to measure exactly. Class applauds the closest estimate.
7	***Book 3, page 64*** 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 <u>actual</u> lengths be in cm? (e.g. 184 mm = 18.4 cm). *30 min*	Individual work, monitored, helped (T could have values and approximations already written on SB or SB or OHP and uncovers each one as it is dealt with) Discussion, reasoning, self-correction, praising Orally at speed round class Praising, encouragement only

Bk3

Lesson Plan 64

Activity		Notes
8	***Book 3, page 64*** Q.2 Read: *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.* What is the shortest possible length the line could be? (11.5 cm or 115 mm or 11 cm 5 mm) 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) Ps draw 4 lines and write their lengths in any way they wish. Ps exchange *Pbs* with neighbours who check measurements are accurate. Review orally with whole class. T asks one or two Ps for their measurements. Class decides whether they are possible. *36 min*	*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
9	***Book 3, page 64*** Q.3 a) Read: *Write these length in millimetres.* Deal with one part at a time. Review orally round class. Mistakes corrected. *Solution:* i) 12 cm = 120 mm; 1 cm 2 mm = 12 mm; 10 cm 2 mm = 102 mm; 102 cm = 1020 mm; 120 cm = 1200 mm; 1 m 2 cm = 1020 mm; 1 m 2 mm = 1002 mm ii) 3 cm 3 mm = 33 mm; 30 cm 3 mm = 303 mm; 3 m 30 cm = 3300 mm; 3 m 3 cm = 3030 mm; 3 m 3 mm = 3003 mm; 33 cm 3 mm = 333 mm; 30 cm 30 mm = 330 mm 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*	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.
10	**Oral practice** T says a length. Ps give it rounded to nearest cm. e.g. 358 mm (36 cm); 612 mm (61 cm); 949 mm (95 cm); 1057 mm (106 cm), etc. Ps explain reasoning too. If problems, write on BB. e.g. BB: 1057 mm = 105 cm 7 mm = 105.7 cm (so rounds up to next whole cm) *45 min*	Whole class activity T chooses Ps at random Reasoning, agreement, praising