Bk4

R: Concept of a fraction. Calculations with whole numbers.
C: Addition and subtraction of fractions
E: Fractions of quantities

Lesson Plan 65

Activity | *Notes*

1

Addition of fractions

T says the addition and also writes it on the BB. Ps calculate mentally or in *Ex. Bks* and come to BB (or show the result on slates or scrap paper on command).

Elicit the abbreviations and then discuss the results. Agree that items of different kinds cannot be added together unless they are changed into a common category, e.g. 'boys' + 'girls' are also ' children'.

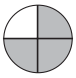
a) BB: 3 apples + 18 apples + 132 apples = 153 apples
$3a + 18a + 132a = 153a$

b) BB: 8 boys + 3 girls + 4 boys + 6 girls + 11 boys + 20 girls
= 23 boys + 29 girls (= 52 children)
$8b + 3g + 4b + 6g + 11b + 20g = 23b + 29g$ (= $52c$)

c) BB: 1 quarter + 1 quarter + 1 quarter = 3 quarters
$1q + 1q + 1q = 3q$

How could we write it using only numbers? Who agrees? Who can think of another way? T helps if necessary

BB: $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{3}{4}$ or $\frac{1}{4} \times 3 = \frac{3}{4}$

Let's draw a diagram to show it. e,g, BB:  or

d) BB: 1 fifth + 2 fifths + 3 fifths = 6 fifths (= 1 + 1 fifth)
$1f + 2f + 3f = 6f$ How could we write it with numbers?

$\frac{1}{5} + \frac{2}{5} + \frac{3}{5} = \frac{6}{5} = 1 + \frac{1}{5} = 1\frac{1}{5}$

Let's show it in a diagram. Ps come to BB or tell T what to draw.

6 min

Whole class activity

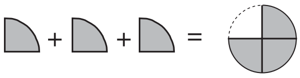
Discussion, reasoning, agreement, praising

[Preparation for algebraic expressions]

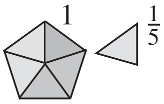
Ps discuss what to do about adding boys and girls.

Only deal with multiplication if Ps think of it themselves.

(A fraction as a multiple of a 'unit fraction'.



Discussion on changing 6 fifths to '1 and 1 fifth'

BB: e.g. 

Praising

2

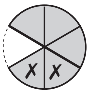
Subtracting fractions

Deal with subtractions in the same way as above. e.g.

a) BB: 15 peaches – 7 peaches = 8 peaches
$15p - 7p = 8p$

b) BB: 5 sixths – 2 sixths = 3 sixths
$5s - 2s = 3s$

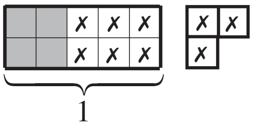
How could we write it with numbers?

BB: $\frac{5}{6} - \frac{2}{6} = \frac{3}{6} \left(= \frac{1}{2}\right)$ Let's show it in a diagram. 

c) BB: 13 tenths – 9 tenths = 4 tenths
$13t - 9 = 4t$

How could we write it with numbers?

BB: $\frac{13}{10} - \frac{9}{10} = \frac{4}{10} \left(= \frac{2}{5}\right)$

Let's show it in a diagram. e.g. BB: 

11 min

Whole class activity

Ps come to BB or show differences on slates or scrap paper in unison on command.

Ps come to BB or dictate what T should write.

Class agrees/disagrees.

Ps draw diagrams on BB or suggest what T should draw.

Extra praise if Ps notice the equivalent (equal) fractions by themselves

Revise meaning of numerator and denominator.

Bk4

Lesson Plan 65

Activity

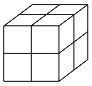
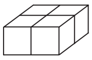
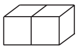
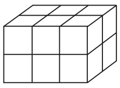
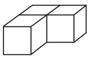
3

Fractions of 1 unit

Study the table. How many unit cubes have been used to make each solid? T points to each in turn and class shouts out the number.

Deal with one row at a time. If this is 1 unit (T points to relevant solid) what part of it are the solids in the other columns? Ps come to BB to write fractions and explain reasoning. Elicit equivalent fractions where relevant.

BB:

						
a)	$1 = \frac{8}{8}$	$\frac{4}{8} = \frac{1}{2}$	$\frac{2}{8} = \frac{1}{4}$	$\frac{1}{8}$	$\frac{12}{8} = 1\frac{4}{8} = 1\frac{1}{2}$	$\frac{3}{8}$
b)	$\frac{8}{4} = 2$	$1 = \frac{4}{4}$	$\frac{2}{4} = \frac{1}{2}$	$\frac{1}{4}$	$\frac{12}{4} = 3$	$\frac{3}{4}$
c)	$\frac{8}{2} = 4$	$\frac{4}{2} = 2$	$1 = \frac{2}{2}$	$\frac{1}{2}$	$\frac{12}{2} = 6$	$\frac{3}{2} = 1\frac{1}{2}$
d)	8	4	2	1	12	3
e)	$\frac{8}{12} = \frac{2}{3}$	$\frac{4}{12} = \frac{1}{3}$	$\frac{2}{12} = \frac{1}{6}$	$\frac{1}{12}$	$1 = \frac{12}{12}$	$\frac{3}{12} = \frac{1}{4}$
f)	$\frac{8}{3} = 2\frac{2}{3}$	$\frac{4}{3} = 1\frac{1}{3}$	$\frac{2}{3}$	$\frac{1}{3}$	$\frac{12}{3} = 4$	$1 = \frac{3}{3}$

20 min

Notes

Whole class activity

Drawn on BB or use enlarged copy master or OHP

(Ideally, T has large models of solids and Ps have smaller versions on desks.)

At a good pace

Reasoning, e.g. a):

'1 unit is 8 small cubes.

This solid is 4 small cubes.
4 out of 8 is 4 eighths or
1 half.'

Agreement, praising

Accept and praise any correct fraction, but extra praise if Ps notice simpler equivalent fractions without help from T.

4

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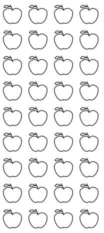
Q.1 Read: *How many apples are in these fractions of the 36 apples?*

Ps do calculations in *Ex. Bks.* and write only the result in their *Pbs*. If class is not very able, deal with one part at a time.
Set a time limit.

Review at BB with whole class. Ps come to BB to write missing numbers, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected. If problems, Ps write the calculation in detail on BB.

Solution:

a)	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{1}{4}$	$\frac{1}{6}$	$\frac{1}{9}$	$\frac{1}{12}$
	$\boxed{18}$	$\boxed{12}$	$\boxed{9}$	$\boxed{6}$	$\boxed{4}$	$\boxed{3}$
b)	$\frac{2}{2}$	$\frac{2}{3}$	$\frac{3}{4}$	$\frac{5}{6}$	$\frac{5}{9}$	$\frac{7}{12}$
	$\boxed{36}$	$\boxed{24}$	$\boxed{27}$	$\boxed{30}$	$\boxed{20}$	$\boxed{21}$



27 min

Individual work monitored, helped

Written on BB or use enlarged copy master or OHP

Reasoning, agreement, self-correction, praising

e.g. BB:

$$\frac{1}{9} \text{ of } 36\text{a} = 36\text{a} \div 9 = 4\text{a},$$

$$\frac{5}{9} \text{ of } 36\text{a} = 4\text{a} \times 5 = \underline{20\text{a}}$$

or: $\frac{5}{9}$ of $36\text{a} = 36\text{a} \div 9 \times 5$

$= 4\text{a} \times 5$

$= \underline{20\text{a}}$

Bk4

Lesson Plan 65

Activity

Notes

5

Book 4, page 65

Q.2 Read: *What part of the ribbon is grey and what part is white? Write an addition and a subtraction about each ribbon.*

If Ps are unsure, do part a) with the whole class first as a model for Ps to follow. Set a time limit.

Review at BB with whole class. Ps come to BB, explaining reasoning. Class agrees/disagrees or suggests alternative solutions (e.g. b) ii): 1 – 5 sixths = 1 sixth). Mistakes discussed/corrected.

Solution:

a)

i) $\frac{\boxed{1}}{3} + \frac{\boxed{2}}{\boxed{3}} = \frac{\boxed{3}}{\boxed{3}} = 1$

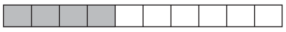
ii) $1 - \frac{\boxed{1}}{\boxed{3}} = \frac{2}{\boxed{3}}$

b)

i) $\frac{\boxed{5}}{6} + \frac{\boxed{1}}{\boxed{6}} = \frac{\boxed{6}}{\boxed{6}} = 1$

ii) $1 - \frac{\boxed{1}}{\boxed{6}} = \frac{\boxed{5}}{\boxed{6}}$

c)



i) $\frac{4}{\boxed{10}} + \frac{\boxed{6}}{\boxed{10}} = \frac{\boxed{10}}{\boxed{10}} = 1$

ii) $1 - \frac{\boxed{6}}{\boxed{10}} = \frac{\boxed{4}}{\boxed{10}}$

d)

i) $\frac{1}{\boxed{4}} + \frac{\boxed{3}}{\boxed{4}} = \frac{\boxed{4}}{\boxed{4}} = 1$

ii) $1 - \frac{\boxed{3}}{\boxed{4}} = \frac{\boxed{1}}{\boxed{4}}$

33 min

Individual work, monitored, helped

Written on BB or use enlarged copy master or OHP

Reasoning, agreement, self-correction, praising

Discuss equivalent fractions.

BB: e.g.

c) ii) $1 - \frac{3}{5} = \frac{2}{5}$

d) ii) $1 - \frac{6}{8} = \frac{2}{8}$

Extra praise if Ps suggest them without T's help

Elicit that if the numerator and denominator of a fraction are divided or multiplied by the same amount, the value of the fraction does not change.

6

Book 4, page 65

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

Deal with one row at a time. Set a time limit.

Review at BB with whole class. Ps come to BB to fill in missing fractions, explaining reasoning. Class agrees/disagrees and points out simpler equivalent fractions where relevant. Mistakes discussed and corrected. Model the fractions on the BB if there are problems.

Solution:

a)	$\frac{1}{5} + \boxed{\frac{4}{5}} = 1$	$\boxed{\frac{2}{5}} + \frac{3}{5} = 1$	$\frac{6}{5} - \boxed{\frac{1}{5}} = 1$	$\boxed{\frac{9}{5}} - \frac{4}{5} = 1$
b)	$\frac{3}{8} + \boxed{\frac{5}{8}} = 1$	$\boxed{\frac{0}{8}} + \frac{8}{8} = 1$ or 0	$\frac{10}{8} - \boxed{\frac{2}{8}} = 1$	$\boxed{\frac{16}{8}} - \frac{8}{8} = 1$ or 2
c)	$\frac{7}{10} + \boxed{\frac{3}{10}} = 1$	$\boxed{\frac{5}{10}} + \frac{5}{10} = 1$ or $\frac{1}{2} + \frac{1}{2} = 1$	$\frac{20}{10} - \boxed{\frac{10}{10}} = 1$ or 2 – 1 = 1	$\boxed{\frac{15}{10}} - \frac{5}{10} = 1$ or $1\frac{1}{2} - \frac{1}{2} = 1$

39 min

Individual work, monitored, helped

(or whole class activity if Ps are unsure)

Written on BB or use enlarged copy master or OHP

Discussion, reasoning, agreement, self-correction, praising

Discuss other forms, e.g.

b) $\frac{10}{8} - \frac{2}{8} = 1\frac{2}{8} - \frac{2}{8} = 1$

c) $\frac{5}{10} + \frac{5}{10} = \frac{1}{2} + \frac{1}{2} = 1$

or as shown in solution.

Feedback for T

Activity

7

Problem

Listen carefully, picture the story in your head and note down the important data. Think about how you would solve it.

Grandma made 15 pancakes for her two grandchildren.
Peter ate 1 third of the pancakes and Rose ate 1 fifth of them.

a) Who ate more and how many more?

A, come and show us how you would solve it. Who agrees? Who would do it another way? etc.

BB: e.g.

P: 1 third of 15 $= 15 \div 3 = \underline{5}$

R: 1 fifth of 15 $= 15 \div 5 = \underline{3}$ $\qquad 3 \underset{2}{<} 5$

Answer: Peter ate 2 more pancakes than Rose.

b) How many pancakes were left and what fraction of the total number of pancakes was it?

B, come and explain how you would solve it. Who agrees? etc.

BB: e.g.

Pancakes eaten: $5 + 3 = \underline{8}$ $\qquad$ Pancakes left: $15 - 8 = \underline{7}$

7 pancakes out of 15 pancakes $= \dfrac{7}{15}$ of the pancakes

Answer: There were 7 pancakes left. This was 7 fifteenths of the total number of pancakes.

45 min

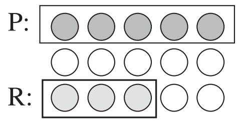
Notes

Whole class activity
(Or individual trial in *Ex. Bks* if Ps wish)

T repeats slowly and a P repeats in own words.

Discussion, reasoning, agreement, praising

Diagram drawn on BB: e.g.



If T and Ps wish, they could discuss this way to solve the problem, thinking of the 15 pancakes as the <u>whole</u> amount:

BB: $1 - \dfrac{1}{3} - \dfrac{1}{5}$

$= \dfrac{15}{15} - \dfrac{5}{15} - \dfrac{3}{15} = \dfrac{7}{15}$

and 7 fifteenths of 15 pancakes $= \underline{7}$ pancakes.

Bk4

R: Concept of a fraction. Calculations

C: Fractions. Addition and subtraction (equal denominators)

E: Fractions of quantities and numbers

Lesson Plan 66

Activity

Notes

1

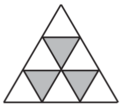
Making fractions

What is a fraction? (part of a whole) Who can come and write a fraction on the BB? What is the bottom number called? (denominator) What does it mean? (Number of equal parts that the whole has been divided into) What is the top number called? (numerator) What does it mean? (How many of these parts are taken)

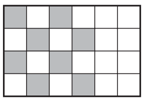
Look at these diagrams. Let's think of fractions we could write about them. Ps come to BB to write fractions (using words or numbers) and explain reasoning (with T's help if necessary). Class agrees/disagrees or suggests equivalent fractions.

BB:

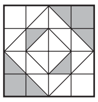
a)



b)



c)



e.g.

a) *Shaded:* 3 ninths = 1 third, $\frac{3}{9} = \frac{1}{3}$

White: 6 ninths = 2 thirds, $\frac{6}{9} = \frac{2}{3}$

b) *Shaded:* 8 twenty-fourths = 4 twelfths = 2 sixths = 1 third

$$\frac{8}{24} = \frac{4}{12} = \frac{2}{6} = \frac{1}{3}$$

White: 16 twenty-fourths = 8 twelfths = 4 sixths = 2 thirds

$$\frac{16}{24} = \frac{8}{12} = \frac{4}{6} = \frac{2}{3}$$

c) *Shaded:* 5 sixteenths = 10 thirty-seconds, $\frac{5}{16} = \frac{10}{32}$

White: 11 sixteenths = 22 thirty-seconds, $\frac{11}{16} = \frac{22}{32}$

Whole class activity

BB: e.g.

$\frac{3}{5}$ ← numerator ← denominator

Drawn on BB or use enlarged copy master or OHP

Reasoning, agreement, praising

Reasoning: e.g.

a) 'The large triangle has been divided into 9 equal parts, so each part is 1 ninth of the whole.

3 of the parts are shaded, so the fraction shaded is 3 ninths.'

BB: Equivalent fractions

e.g. $\frac{3}{9} = \frac{1}{3}$

T or P could highlight the thirds, etc. on the diagram.

In c), only mention 'thirty-seconds' if a P suggests it.

6 min

2

Addition and subtraction

Let's do these additions and subtractions. T says the addition and also writes it on the BB. Ps come to BB to write the sum or dictate what T should write, explaining reasoning. Class agrees/disagrees. How can we write it in a shorter way? (Using initial letters and/or numbers.)

BB:

a) 82 tables + 53 tables + 200 tables = 335 tables
or 82t + 53t + 200t = 335t

b) 31 pens + 54 balls + 24 pens – 32 balls = 55 pens + 22 balls
or 31p + 54b + 24p – 32b = 55p + 22b

c) 1 eighth + 1 eighth + 1 eighth + 1 eighth + 1 eighth = 1 eighth × 5
or 1e + 1e + 1e + 1e + 1e = 1e × 5 = 5e = 5 eighths

or $\frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} = \frac{1}{8} \times 5 = \frac{5}{8}$

d) 5 ninths + 3 ninths – 4 ninths + 7 ninths = 11 ninths = 1 and 2 ninths

or $\frac{5}{9} + \frac{3}{9} - \frac{4}{9} + \frac{7}{9} = \frac{11}{9} = 1\frac{2}{9}$

e) 2 fifths + 3 tenths + 1 fifth – 2 tenths + 3 tenths = 3 fifths + 4 tenths

or $\frac{2}{5} + \frac{3}{10} + \frac{1}{5} - \frac{2}{10} + \frac{3}{10} = \frac{3}{5} + \frac{4}{10} = \frac{6}{10} + \frac{4}{10} = 1$

Whole class activity

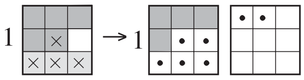
Ps can do calculations in *Ex. Bks*. or on slates if necessary.

Discussion, reasoning, agreement, praising

If problems, Ps draw diagrams on BB to show the fractions.

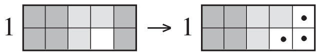
BB: e.g.

d) 5n + 3n – 4n + 7n = 11n

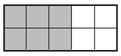


e)

2f + 3t + 1f – 2t + 3t = 3f + 4t



Show that: $\frac{3}{5} = \frac{6}{10}$



or $\frac{4}{10} = \frac{2}{5}$, so $\frac{3}{5} + \frac{2}{5} = 1$

16 min

Activity

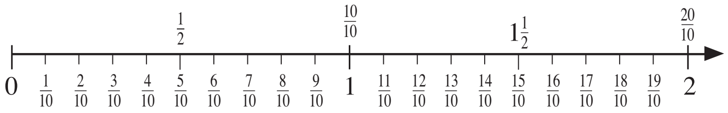
3

Fractions on the number line

Let's show jumps along the number line by fractions of a unit.

Ps come to BB to follow instructions from the T. e.g.

a) Elicit that there is a tick at every 1 tenth of a unit.

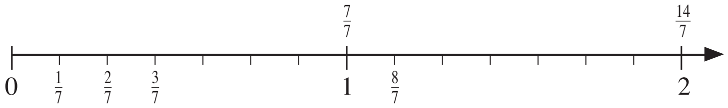


Start at 0. Move 3 tenths to the right (3 tenths), than another 5 tenths to the right (8 tenths), then 2 tenths to the left (6 tenths), then 9 tenths to the right (15 tenths), then 4 tenths to the right. Where have you ended up? (1 and 9 tenths or 19 tenths)

Let's write the moves as a calculation with fractions. Ps dictate to T or come to BB. T reminds Ps of the steps if necessary.

BB: $0+\frac{3}{10}+\frac{5}{10}-\frac{2}{10}+\frac{9}{10}+\frac{4}{10}=\frac{19}{10}=1\frac{9}{10}$

b) Elicit that this number line has a tick at every 1 seventh of a unit.



Ps give instructions to another P who shows the moves along the number line, while another P (or T) writes the operations on the BB.

Notes

Whole class activity

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

(Ps could have copies on desks too and follow the instructions on their own number lines.)

T gives instructions. P shows moves with finger or pointer and says the number reached after each step.

Class points out errors.

Ps read the operation in unison.

Discussion, agreement, praising

BB: e.g.

$\frac{2}{7}+\frac{5}{7}-\frac{1}{7}+\frac{6}{7}=\frac{12}{7}=1\frac{5}{7}$

Ps label any missing relevant fraction.

25 min

4

Book 4, page 66

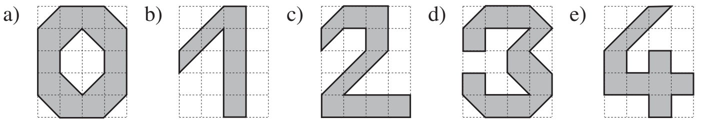
Q.1 Read: *Each diagram is 1 unit. Write an addition and subtraction about each diagram.*

Elicit that the rectangles are <u>congruent</u> and that each has been divided up into $4 \times 5 = \underline{20}$ equal parts, so each grid square is 1 twentieth of the large rectangle.

Do part a) with the whole class first as a model for Ps to follow. Rest done as individual work. Deal with one at a time.

Review at BB with whole class. Ps come to BB or dictate their operations to T. Class agrees/disagrees or suggests a simpler form of the fraction where relevant. Mistakes discussed and corrected.

Solution:



a) $\frac{14}{20}+\frac{6}{20}=1$, $1-\frac{6}{20}=\frac{14}{20}$

b) $\frac{7}{20}+\frac{13}{20}=1$, $1-\frac{13}{20}=\frac{7}{20}$

c) $\frac{10}{20}+\frac{10}{20}=1$, $1-\frac{10}{20}=\frac{10}{20}$

d) $\frac{12}{20}+\frac{8}{20}=1$, $1-\frac{8}{20}=\frac{12}{20}$

e) $\frac{9}{20}+\frac{11}{20}=1$, $1-\frac{11}{20}=\frac{9}{20}$

Notes

Individual work, monitored, helped

(or continue as a whole class acitvity if Ps are unsure)

Drawn on BB or use enlarged copy master or OHP

Reasoning, agreement, self-correction, praising

Discuss equivalent fractions

e.g. $\frac{14}{20}=\frac{7}{10}$

or $\frac{7}{20}=\frac{14}{40}$

(if each grid square is divided into 2 equal triangles)

30 min

Bk4

Lesson Plan 66

Activity — ***Notes***

5

Book 4, page 66

Q.2 Read: *Write the additions and subtractions with fractions in your exercise book and calculate the result.*

Set a time limit. Ps can draw diagrams in *Ex. Bks* to help them if they wish.

Review at BB with whole class. Ps come to BB or dictate results to T, explaining reasoning. Class agrees/disagrees or points out simpler equivalent fractions where relevant. Ask Ps to model the operations on the BB.

Solution:

a) $\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$

b) $\frac{1}{2} + \frac{1}{2} + \frac{1}{2} = \frac{3}{2} = 1\frac{1}{2}$

c) $\frac{3}{4} - \frac{1}{4} = \frac{2}{4} = \frac{1}{2}$

d) $\frac{2}{5} + \frac{2}{5} = \frac{4}{5}$

e) $\frac{5}{6} - \frac{4}{6} = \frac{1}{6}$

f) $\frac{1}{7} + \frac{3}{7} - \frac{4}{7} = \frac{0}{7} = \underline{0}$

g) $\frac{3}{8} + \frac{10}{8} - \frac{5}{8} = \frac{8}{8} = \underline{1}$

h) $\frac{8}{9} - \frac{3}{9} = \frac{5}{9}$

i) $\frac{10}{10} - \frac{7}{10} + \frac{2}{10} = \frac{5}{10} = \frac{1}{2}$

i) $\frac{10}{10} - \frac{8}{10} - \frac{1}{10} = \frac{1}{10}$

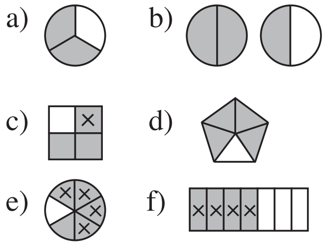
Individual work, monitored, helped

Written on BB or SB or OHT

Discussion, reasoning, agreement, self-correction, praising

T helps with drawing the diagrams.

BB: e.g.



etc.

Extra praise if Ps draw diagrams and explain reasoning without help.

35 min

6

Book 4, page 66

Q.3 Read: *Calculate the sums and differences.*

Set a time limit. Ps can draw diagrams on slates or in *Ex Bks*. if necessary.

Review at BB with whole class. Ps come to BB or dictate to T, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected. Draw diagrams on BB if there is disagreement.

Solution:

a) $\frac{1}{2} + \frac{1}{2} = \frac{2}{2} = 1$

b) $\frac{3}{5} + \frac{1}{5} = \frac{4}{5}$

c) $\frac{2}{3} - \frac{1}{3} = \frac{1}{3}$

d) $\frac{3}{4} - \frac{2}{4} = \frac{1}{4}$

e) $\frac{4}{5} - \frac{4}{5} = \frac{0}{5} = 0$

f) $\frac{6}{6} + \frac{1}{6} = \frac{7}{6} = 1 + \frac{1}{6} = 1\frac{1}{6}$

g) $\frac{7}{10} - \frac{4}{10} = \frac{3}{10}$

h) $\frac{3}{20} + \frac{0}{20} = \frac{3}{20}$

Individual work, monitored, helped

(or whole class activity if T thinks Ps are still unsure)

Written on BB or SB or OHT

Discussion, reasoning, agreement, self-correction, praising

Feedback for T.

h) Elicit that $\frac{0}{20} = 0$

40 min

Bk4

Lesson Plan 66

Activity

7

Book 4, page 66*, *Q.4

Read: *Hedgehog lives 400 m away from Squirrel.*

One day, Squirrel went to visit Hedgehog.

In the first minute, Squirrel covered 2 fifths of the route.
In the second minute, Squirrel covered another 2 fifths of the route.

How many metres did Squirrel still have to go?

Elicit that the 400 m has been divided into 5 equal parts and that each part is 1 fifth. Ps come to BB to show on the diagram how far *Squirrel* had gone after the 1st and 2nd minutes.

What <u>part</u> of the journey did he still have to do? (1 fifth)

How can we write it as an operation? Ps come to BB or dictate to T. Class agrees/disagrees.

BB: *S* had gone: $\frac{2}{5} + \frac{2}{5} = \frac{4}{5}$ of the journey

S still had to go: $1 - \frac{4}{5} = \frac{5}{5} - \frac{4}{5} = \frac{1}{5}$ of the journey

How many metres is this? P comes to BB or dictates to T.

BB: $\frac{1}{5}$ of 400 m = 400 m ÷ 5 = $\underline{80\text{ m}}$

Answer: Squirrel still had to go 80 metres.

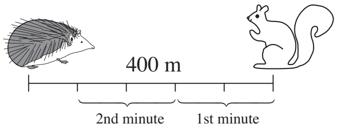
45 min

Notes

Whole class activity
(or individual work if Ps wish)

Diagram drawn on BB or use enlarged copy master or OHP

BB:



Discussion, reasoning, agreement, praising

Or Ps might suggest finding 2 fifths of the distance first.

BB: 1 fifth of 400 m
= 400 m ÷ 5 = 80 m

2 fifths of 400 m = 80 m × 2
= 160 m

S had gone:

160 m + 160 m = 320 m

S still had to go:

400 m – 320 m =<u>80 m</u>

Bk4

R: Fractions. Fractions of quantities

C: Addition and subtraction of fractions

E: Problems

Lesson Plan 67

Activity

Notes

1

Fractions of quantities.

Listen carefully, do the calculation in your head or in you *Ex. Bks* and show me the answer when I say. Remember to write the unit of measure too!

Ps responding correctly explain at BB to those who did not. Who did the same? Who did it a different way? What mistakes did you make? etc. If problems, ask Ps to show calculations in detail and to draw digrams on the BB.

a) What is:

i) 1 third of 96 m (96 m ÷ 3 = <u>32 m</u>)

ii) 1 fifth of 2400 kg (2400 kg ÷ 5 = <u>480 kg</u>)

iii) 3 fifths of 820 litres (820 litres ÷ 5 × 3 = 164 litres × 3 = <u>492 litres)</u>

iv) 8 tenths of 9200 km (9200 km ÷ 10 × 8 = 920 km × 8 = <u>7360 km)</u>

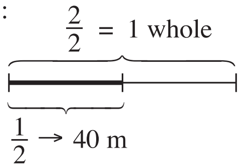
v) 7 quarters of £6000? (£6000 ÷ 4 × 7 = £1500 ×7 = <u>£10 500)</u>

b) What is the whole quantity if:

i) 40 m is half of it

(1 half → 40 m,
2 halves → 40 m × 2 = <u>80 m</u>)

BB:



ii) 80 kg is 2 thirds of it? (2 thirds → 80 kg,
3 thirds → 80 kg ÷ 2 × 3
= 40 kg × 3 = <u>120 kg)</u>

(or 2 thirds → 80 kg,
1 third → 80 kg ÷ 2 = 40 kg [Direct proportion]
3 thirds → 40 kg × 3 = <u>120 kg</u>)

10 min

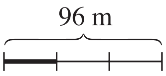
Whole class activity

Answers written on scrap paper or slates and shown in unison on command.

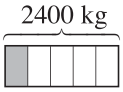
Reasoning, agreement, praising

BB: e.g

a) i)



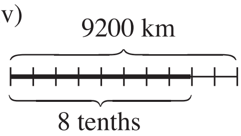
ii)



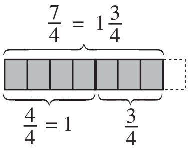
iii)

```
   1 6 4      1 6 4
5 │8 2 0       × 3
   3 2        4 9 2
              1 1
```

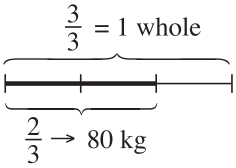
iv)



v)



b) ii)



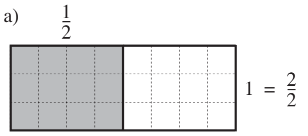
Accept any correct method and diagram.

2

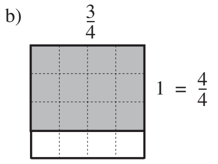
Fractions of a shape

Let's draw the whole shape if the shaded parts are the fractions shown. Ps come to BB to count the grid squares in the shaded part, calculate how many grid squares would be in the whole shape, then draw it. Class agrees/disagrees.

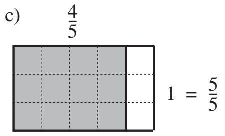
BB: e.g.



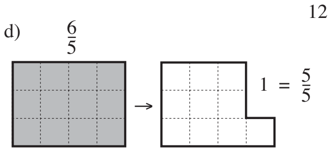
12 × 2 = 24 (squares)



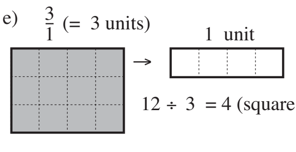
12 ÷ 3 × 4 = 16 (squares)



12 ÷ 4 × 5 = 15 (squares)



12 ÷ 6 × 5 = 10 (squares)



12 ÷ 3 = 4 (squares)

16 min

Whole class activity

Drawn on BB or use enlarged copy master or OHP

At a good pace

Reasoning, agreement, praising

or Reasoning: e.g.

b) 3 quarters is 12 squares,
1 quarter is 4 squares,
4 quarters is <u>16</u> squares

Feedback for T

Activity | ***Notes***

3

Addition and subtraction of fractions

Let's draw diagrams to help us work out the answers.

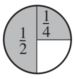
T could do part a) first (but allowing Ps to dictate what to draw or write) as a model for Ps to follow. Can we add halves and quarters? (No, as they have different denominators.) What should we do? (Change the half to 2 quarters) etc.

Ps come to BB, draw a diagram, decide on the number of parts to divide it up into (i.e. the smallest multiple common to both denominators) with T's help if necessary, convert the fractions and do the additions or subtractions, explaining reasoning. Class agrees/disagrees .

Ask Ps to show each operation on the relevant segment of the number line. (drawn on BB or OHT or use copy master).

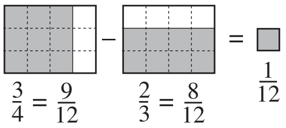
BB:

a) $\frac{1}{2} + \frac{1}{4} = \left(\frac{2}{4} + \frac{1}{4} = \frac{2+1}{4} = \frac{3}{4}\right)$ e.g.

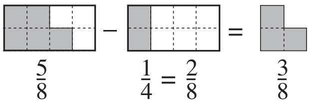


$\frac{1}{2} = \frac{2}{4}$

b) $\frac{3}{4} - \frac{2}{3} = \left(\frac{9}{12} - \frac{8}{12} = \frac{1}{12}\right)$ e.g.



c) $\frac{5}{8} - \frac{1}{4} = \left(\frac{5}{8} - \frac{2}{8} = \frac{3}{8}\right)$ e.g.



25 min

Whole class activity

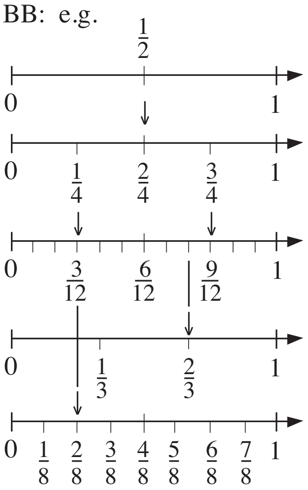
Written/drawn on BB or use enlarged copy master for the number line segements.

At a good pace

Discussion, reasoning, agreement, praising

Feedback for T

BB: e.g.



4

Book 4, page 67

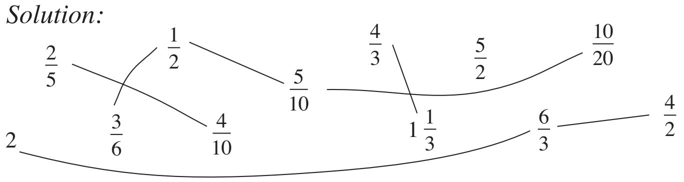
Q.1 Read: *Join up the equal numbers.*

Discuss equivalent fractions. Elicit that if the numerator and denominator are multiplied or divided by the same number, the fractions have the same value, i.e. they are <u>equal</u> or <u>equivalent</u> fractions.

Ps can draw diagrams on scrap paper or slates or in *Ex.Bks* if necessary. Set a time limit.

Review at BB with whole class. Ps come to BB to draw joining lines, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected. Draw diagrams on BB if there are problems or disagreements.

Solution:



Who can think of numbers to join to $\frac{5}{2}$? (e.g. $\frac{10}{4}$, $2\frac{1}{2}$)

Extension

Compare the fractions to 1, 2 or 3. Ps write inequalities about them.

e.g. $\frac{2}{5} < \frac{5}{10} < 1$, $2 < \frac{5}{2} < 3$, etc.

30 min

Individual work, monitored helped

(or whole class activity if Ps are still unsure)

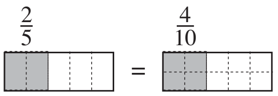
Written on BB or use enlarged copy master or OHP

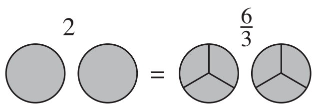
BB: <u>Equivalent fractions</u>

e.g. $\frac{1}{3} = \frac{2}{6}$

Reasoning, agreement, self-correction, praising

Diagrams: e.g.





Feedback for T

Bk4

Lesson Plan 67

Activity

5

Book 4, page 67

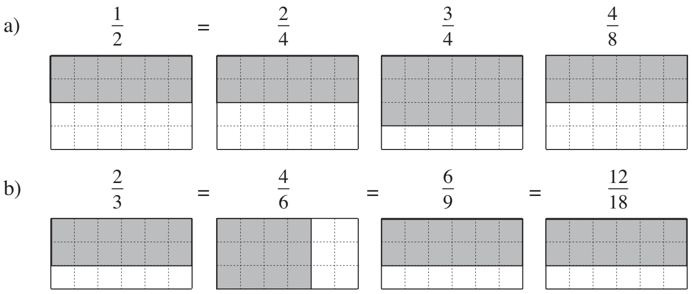
Q.2 Read: *Each rectangle is 1 unit. Colour the parts given.*

Deal with one row at a time. Set a time limit.

Review at BB with whole class. Ps come to BB to colour diagrams or T has a solution already prepared and uncovers each rectangle as it is dealt with. In either case, Ps explain their reasoning. Class agrees/disagrees. Mistakes discussed and corrected. Agree on the number of squares which should be shaded but also that they can be in any position.

Which fractions are equivalent (equal)?

Solution: e.g.



Notes

Individual work, monitored, helped

Drawn on BB or use enlarged copy master or OHP

Reasoning, agreement, self-correction, praising

Reasoning: e.g.

$$\frac{4}{8} \text{ of } 24 = 24 \div 8 \times 4$$
$$= 3 \times 4 = \underline{12}$$

Equivalent fractions:

a) $\frac{1}{2} = \frac{2}{4} = \frac{4}{8}$;

b) All 4 are equivalent

Agree that multiplying or dividing the numerator and denominator by the same amount does not change the value of a fraction.

35 min

6

Book 4, page 67

Q.3 Read: *Complete the diagrams to match the problems.*

Deal with one part at a time. Ps read the question themselves and write the missing numbers on the dotted lines. Make sure that Ps realise that they should write a <u>fraction</u> on the lines labelled 'part'. Remind Ps to check that the two parts and the two distances add up to the <u>whole</u> distance. Set a time limit.

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

Solution:

a) *The distance between two cities is 369 km.*

A family drove 1 third of the distance before lunch and completed the journey after lunch.

How far did they drive: i) before lunch ii) after lunch?

Morning: 1 third of 369 km = 369 km ÷ 3 = <u>123 km</u>

Afternoon: 2 thirds of 369 km = 123 km × 2 = <u>246 km</u>

b) *Some men are laying a pavement.*

They have already paved 120 m, which is 2 thirds of the pavement.

i) How much do they still have to do?

Done: 2 thirds → 120 m

Still to do: 1 third → 120 m ÷ 2 = <u>60 m</u>

ii) How long will the finished pavement be?

Finished pavement: 3 thirds → 60 m × 3 = <u>180 m</u>

Individual work, monitored, helped

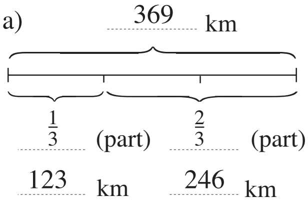
(or whole class activity if Ps are unsure)

Drawn on BB or use enlarged copy master or OHP

Reasoning, agreement, self-correction, praising

BB:

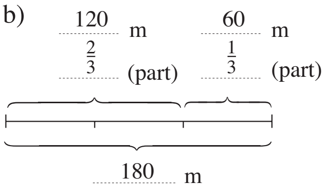
a)



Check: $\frac{1}{3} + \frac{2}{3} = \frac{3}{3} = 1$

123 + 246 = 369 (km) ✔

b)



Check: $\frac{2}{3} + \frac{1}{3} = \frac{3}{3} = 1$

120 + 60 = 180 (m) ✔

40 min

Bk4

Lesson Plan 67

Activity

7

Book 4, page 67

Q.4 Let's see how many of these you can do in 3 minutes! You can draw diagrams or calculate in your *Ex. Bk* if necessary. Start . . . now! . . . Stop!

Review at BB with whole class. Ps come to BB or dictate to T, explaining reasoning. If problems, Ps draw diagrams on BB. Mistakes discussed and corrected Elicit equivalent fractions.

Solution:

a) $\frac{1}{5} + \frac{1}{5} + \frac{1}{5} = \frac{3}{5} \left(= \frac{1}{5} \times 3\right)$ b) $\frac{3}{8} + \frac{2}{8} = \frac{5}{8}$

c) $\frac{7}{12} - \frac{2}{12} = \frac{5}{12}$ d) $\frac{11}{20} - \frac{9}{20} = \frac{2}{20} \left(= \frac{1}{10}\right)$

e) $\frac{7}{10} + \frac{3}{5} = \frac{7}{10} + \frac{6}{10} = \frac{13}{10} = 1 + \frac{3}{10} = 1\frac{3}{10}$

f) $\frac{3}{4} - \frac{3}{8} = \frac{6}{8} - \frac{3}{8} = \frac{3}{8}$

45 min

Notes

Individual work, monitored, helped

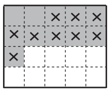
(or parts e) and f) done with the whole class)

Written on BB or SB or OHT

Discussion, reasoning, agreement, self-correction, praising

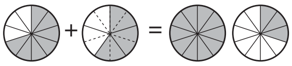
BB: Diagrams: e.g.

d)



$\frac{2}{20} = \frac{1}{10}$

e)



f)

Bk4

R: Fractions and fraactions of quantities
C: Addition and subtraction of fractions
E: Problems

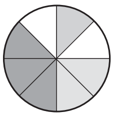
Lesson Plan
68

Activity | *Notes*

1

Addition and subtraction of fractions

Study the diagram. What can you tell me about it? BB:



(It is a circle; it has been divided into 8 equal parts; each part is 1 eighth)

a) Let's write additions and subtractions about it. Ps come to BB to write operations, explaining reasoning. Class agrees/disagrees or suggests simpler equivalent fractions.

BB: e.g.

$$\frac{1}{8} + \frac{2}{8} + \frac{3}{8} = \frac{6}{8} = \frac{3}{4} \left(= \frac{1}{8} + \frac{1}{4} + \frac{3}{8} \right)$$

$$\frac{8}{8} - \frac{3}{8} - \frac{2}{8} - \frac{1}{8} = \frac{2}{8} = \frac{1}{4}, \quad 1 - \frac{3}{8} = \frac{5}{8}, \quad \text{etc.}$$

To save time writing all the '8's as the denominators, we can write just one '8' as the common denominator, eighths, and write how many eighths we are dealing with above the fraction line.

e.g. $$\frac{8}{8} - \left(\frac{3}{8} + \frac{2}{8} + \frac{1}{8} \right) = \frac{8 - (3 + 2 + 1)}{8} = \frac{8 - 6}{8} = \frac{2}{8} = \frac{1}{4}$$

b) Let's compare the fractions. Who can write an inequality about the diagram? Ps come to BB or dictate to T. Class agrees/disagrees.

e.g. $\frac{3}{8} > \frac{1}{8}$, $\frac{1}{4} < \frac{3}{8}$, $\frac{3}{4} + \frac{1}{8} < 1$, etc.

c) Ps suggest word problems for one or two of the operations on the BB. Class decides whether they are valid.

5 min

Whole class activity

Drawn on BB or use enlarged copy master or OHT

At a good pace

Reasoning, agreement, praising

Extra praise if Ps write the equivalent fractions without help from T.

T demonstrates the 'quick' way of calculating with fractions, explaining each step.

(Ps are not expected to learn it yet, just to become familiar with it.)

Reasoning, agreement, praising

Accept any correct statement.

Extra praise for creative, correct contexts

2

Comparing fractions

Which is more and how much more? Ps come to BB to write missing signs and differences, explaining reasoning. Class agrees/disagrees. Ask Ps to draw diagrams too. T might need to help with b) iv).

a) Let's compare these fractions to 1.

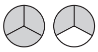
BB: e.g.

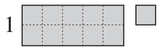
i) $\frac{3}{5} \boxed{<} 1$, $\boxed{\frac{2}{5}}$

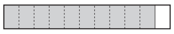
ii) $\frac{5}{3} \boxed{>} 1$, $\boxed{\frac{2}{3}}$

iii) $\frac{11}{10} \boxed{>} 1$, $\boxed{\frac{1}{10}}$

iv) $\frac{10}{11} \boxed{<} 1$, $\boxed{\frac{1}{11}}$







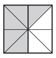
b) Let's compare these fractions to a half.

i) $\frac{5}{8} \boxed{>} \frac{1}{2}$, $\boxed{\frac{1}{8}}$

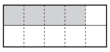
ii) $\frac{4}{10} \boxed{<} \frac{1}{2}$, $\boxed{\frac{1}{10}}$

iii) $\frac{7}{14} \boxed{=} \frac{1}{2}$, $\boxed{0}$

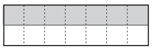
iv) $\frac{5}{11} \boxed{<} \frac{1}{2}$, $\boxed{\frac{1}{22}}$



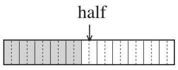
$\frac{1}{2} = \frac{4}{8}$



$\frac{1}{2} = \frac{5}{10}$



$\frac{1}{2} = \frac{7}{14}$



$\frac{10}{22} < \frac{11}{22}$

13 min

Whole class activity

Written on BB or use enlarged copy master or OHP

Discussion, reasoning, agreement, praising

Agree that:

$$1 = \frac{5}{5} = \frac{3}{3} = \frac{10}{10} = \frac{11}{11}$$

Reasoning, agreement, praising

Discussion on how many eighths, tenths, etc. make 1 half.

iv) Agree that half of 11 elevenths = 5 and a half elevenths (or 11 twenty-seconds)

Activity

Notes

3

Mental practice

Ps stand up. T throws a ball to a P, saying a fraction, e.g. T: 'half of 4'; P throws ball back to T saying the number, e.g. P: '2'.

Class points out errors. Ps who are correct sit down. Ps who are incorrect stay standing and later are asked a simpler question. e.g.

half of 10 (5); 1 third of 21 (7); 3 quarters of 8 (6); 2 fifths of 20 (8)
3 halves of 50 m (75 m); 7 sevenths of £213 (£213); 0 fifths of 100 (0),
3 elevenths of 22 acorns (6 acorns); 12 sixths of 1 hour (2 hours), etc.

If problems, Ps show details of calculations on BB.

e.g. 3 quarters of 8 $= 8 \div 4 \times 3 = 2 \times 3 = 6$

Whole class activity

T walks round class, choosing Ps at random

At speed but in good humour!

Praising, encouragement only

Ps can ask the questions too.

[Catching and throwing the ball gives Ps a little more time to think.]

18 min

4

Sequences

a) T writes first 2 terms of a sequence on the BB and gives the rule.

Ps come to BB to continue the terms (or dictate terms to T), explaining reasoning. Class points out errors. Ps point out those fractions which could be written in another way.

i) This sequence is increasing by 1 sixth.

BB: $0,\ \frac{1}{6},\ \left(\frac{2}{6},\ \frac{3}{6},\ \frac{4}{6},\ \frac{5}{6},\ \frac{6}{6},\ \frac{7}{6},\ \dots\right)$

or $\frac{1}{3}\quad \frac{1}{2}\quad \frac{2}{3}\qquad 1\quad 1\frac{1}{6}$, etc.

ii) This sequence is decreasing by 3 tenths.

BB: $4\frac{5}{10},\ 4\frac{2}{10},\ \left(3\frac{9}{10},\ 3\frac{6}{10},\ 3\frac{3}{10},\ 3,\ 2\frac{7}{10},\ 2\frac{4}{10},\ 2\frac{1}{10},\ \dots\right)$

or $4\frac{1}{2}\quad 4\frac{1}{5}\qquad 3\frac{3}{5}\qquad 2\frac{2}{5}$

b) T writes the first 4 terms of a sequence on the BB. Ps think of a rule, then continue the sequence. Again Ps point out fractions which could be written in another way.

BB: $\frac{3}{7},\ \frac{7}{7},\ \frac{11}{7},\ \frac{15}{7},\ \left(\frac{19}{7},\ \frac{23}{7},\ \frac{27}{7},\ \frac{31}{7},\ \frac{35}{7},\ \frac{39}{7},\ \frac{43}{7},\ \dots\right)$

$1\quad 1\frac{4}{7}\quad 2\frac{1}{7}\quad 2\frac{5}{7}\quad 3\frac{2}{7}\quad 3\frac{6}{7}$ etc. $\boxed{\textit{Rule}:\ +\ \frac{4}{7}}$

Whole classs activity

Written on BB

Reasoning, agreement, praising

At a good pace

T decides when to stop.

Continue to negative numbers if Ps are able.

$\dots,\ 0,\ -\frac{3}{10},\ -\frac{6}{10},\ \dots$

Discussion on the rule.

Extension

If the sequence started before 3 sevenths, what would the 2 terms before it be?

$\dots,\ -\frac{5}{7},\ -\frac{1}{7},\ \frac{3}{7},\ \dots$

Show on a number line.

25 min

5

Book 4, page 68

Q.1 Read: *Solve the problem. Do the calculations in your Ex. Bk.*

Ps read the problem themselves, solve it in their *Ex. Bks* and write the answers in their *Pbs*. Set a time limit

Review with the whole class. T could read each part and Ps show answers on scrap paper or slates on command. P who responds correctly explains to those who do not. Mistakes discussed and corrected.

Solution:

a) *What kind of tree does he have most of?* (Equal numbers)

b) i) *How many plum trees does Sam have?* (20)

ii) *What fraction of all Sam's trees are they?* (1 quarter)

Individual work, monitored, helped

Reasoning, agreement, self-correction, praising

BB: a) $\frac{2}{8} = \frac{4}{16} = \frac{1}{4}$

b) $1 - \left(\frac{1}{4} + \frac{1}{4} + \frac{1}{4}\right) = \frac{1}{4}$

$\frac{1}{4}$ of $80 = 80 \div 4 = \underline{20}$

Sam has 20 of each type of tree.

30 min

Activity

Notes

6

Book 4, page 68

Q.2 Read: *Use the number lines to help you do the additions and subtractions.*

Deal with one part at a time. Set a time limit. Ps may draw other models if necessary in their *Ex. Bks*.

Review at BB with whole class. Ps come to BB to complete the operations and explain their reasoning, showing the jumps along the number line. Class agrees/disagrees. Mistakes discussed and corrected.

Solution:

a) $\frac{1}{2} + \frac{3}{4} + \frac{1}{2} = 1 + \frac{3}{4} = 1\frac{3}{4}$

or $\frac{2}{4} + \frac{3}{4} + \frac{2}{4} = \frac{7}{4} = 1\frac{3}{4}$

b) $\frac{4}{5} - \frac{1}{5} = \frac{3}{5}$

c) $\frac{5}{6} + \frac{2}{6} - \frac{4}{6} = \frac{7}{6} - \frac{4}{6} = \frac{3}{6} = \frac{1}{2}$

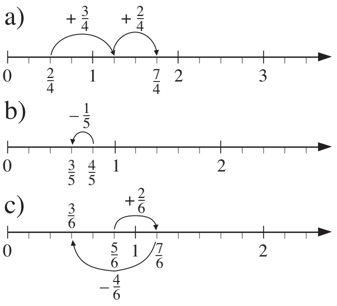
Individual work, monitored, helped

Written/drawn on BB or use enlarged copy master or OHP

Discussion, reasoning, agreement, self-correction, praising

Discuss equivalent fractions where relevant.

BB:



35 min

7

Book 4, page 68

Q.3 Read: *Solve the problems in your exercise book. Remember to convert the units.*

Set a time limit. Ps can draw diagrams to help them visualise the problem.

Review at BB with whole class Ps could show answers on scrap paper or slates on command. Ps responding correctly explain at BB to those who did not. Class agrees/disagrees. Mistakes discussed and corrected.

Solution: e.g.

a) *Mum bought a loaf which weighed 3 quarters of a kg. Rob ate 1 fifth of it. How much bread did Rob eat?*

Whole loaf: $\frac{3}{4}$ of 1 kg = $\frac{3}{4}$ of 1000 g

$\frac{3}{4}$ of 1000 g = 1000 g ÷ 4 × 3 = 250 g ×3 = 750 g

Amount eaten: $\frac{1}{5}$ of 750 g = 750 g ÷ 5 = <u>150 g</u>

Answer: Rob ate 150 g of bread

b) *Diane spent £616, which was 2 fifths of her money. How much money did Diane have before?*

Spent: $\frac{2}{5} \rightarrow$ £616, (so $\frac{1}{5} \rightarrow$ £616 ÷ 2 = £308)

Had before: $\frac{5}{5} \rightarrow$ £616 ÷ 2 × 5 = £308 × 5 = <u>£1540</u>

Answer: Diane had £1540 before.

Individual work, monitored, helped

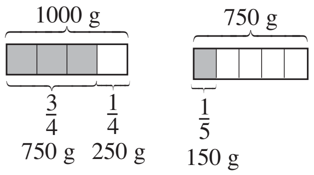
(or whole class activity if Ps are still unsure)

Responses shown in unison.

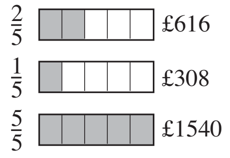
Reasoning, agreement, self-correction, praising

Draw diagrams on BB if necessary.

BB: e.g.



BB: e.g.



Feedback for T

40 min

Activity

8

Book 4, page 68*, *Q.4

Read: *Work out the rule and complete the table. Write the rule in different ways.*

Ask several Ps what they think the rule is. Class decides on one version of the rule in words. (e.g. bottom row – top row = 4 tenths) and check that it works in the columns already given.

Ps come to BB to choose a column and write missing fraction, explaining reasoning. Class agrees/disagrees or suggests simpler equivalent fractions, or whole numbers and fractions, where relevant. (See solution below.)

Who can write the rule in a mathematical way? Who agrees? Who can think of another way to write it? Class checks with values in the table.

Solution:

			$\frac{4}{5}$	$\frac{1}{2}$		$\frac{3}{5}$			$2\frac{7}{10}$	$\frac{2}{5}$
a	$\frac{3}{10}$	$\frac{1}{10}$	$\frac{8}{10}$	$\frac{5}{10}$	$\mathbf{0}$	$\mathbf{\frac{6}{10}}$	$2\frac{1}{10}$	$\frac{1}{5}$	$\mathbf{\frac{27}{10}}$	$\mathbf{\frac{4}{10}}$
b	$\frac{7}{10}$	$\frac{5}{10}$	$\frac{12}{10}$	$\mathbf{\frac{9}{10}}$	$\frac{4}{10}$	1	$\mathbf{2\frac{5}{10}}$	$\mathbf{\frac{6}{10}}$	$\frac{31}{10}$	$\frac{4}{5}$
		$\frac{1}{2}$	$1\frac{1}{5}$		$\frac{2}{5}$		$2\frac{1}{2}$	$\frac{3}{5}$	$3\frac{1}{10}$	$\frac{8}{10}$

Rule: $a = b - \frac{4}{10}$, $b = a + \frac{4}{10}$, $b - a = \frac{4}{10}\ \left(= \frac{2}{5}\right)$

45 min

Notes

Whole class activity
(or individual work if Ps wish)

Drawn on BB or use enlarged copy master or OHP

Discussion/agreement on one form of the rule.

At a good pace

Reasoning, agreement, praising

Feedback for T

Bold numbers were missing.

Extension

Ps think of a problem in context for the table and rule.

Bk4

R: Mental and written calculation

C: Review and practice: whole numbers and fractions

E: Problems

Lesson Plan 69

Activity

Notes

1

Sequences

T says first 3 or 4 terms of a sequence and writes them on the BB. When you have worked out the rule, stand up!

T chooses Ps at random from those standing to continue the sequence and writes Ps' terms on BB. Class agrees/disagrees.

A, what rule did you use? Who agrees? etc. Let's check it.

a) 3500, 3360, 3220, 3080, (2940, 2800, 2660, 2520, 2380, 2240, 2100, 1960, . . .) *Rule:* – 140

b) 2, 202, 502, 902, (1402, 2002, 2702, 3502, 4402, 5402, . . .)

200 300 400 500 600 700 800 900 1000 . . .

Rule: The difference between the terms is increasing by 100.

c) 12 800, 6400, 3200, (1600, 800, 400, 200, 100, 50, 25, $[12\frac{1}{2},\ 6\frac{1}{4},\ 3\frac{1}{8},\ \dots]$) *Rule*: ÷ 2

d) $\frac{1}{5},\ \frac{2}{5},\ \frac{3}{5},\ (\frac{4}{5},\ \frac{5}{5} = 1,\ \frac{6}{5} = 1\frac{1}{5},\ \frac{7}{5} = 1\frac{2}{5},\ \frac{8}{5} = 1\frac{3}{5},\ \frac{9}{5} = 1\frac{4}{5},\ \frac{10}{5} = 2,\ \frac{11}{5} = 2\frac{1}{5},\ \dots)$ *Rule*: $+\frac{1}{5}$

e) $3\frac{8}{10},\ 3\frac{3}{10},\ 2\frac{8}{10},\ (\ 2\frac{3}{10},\ 1\frac{8}{10},\ 1\frac{3}{10},\ \frac{8}{10},\ \frac{3}{10},\ [-\ \frac{2}{10},\ \dots)$

Whole class activity

(Or individual work in *Ex. Bks*. T dictates the first few terms, Ps copy into *Ex. Bks*., then continue the sequence under a time limit. Review at BB with whole class.)

Written on BB or SB or OHT

At a good pace

T decides when to stop

Checking, agreement, praising

Extra praise for Ps who can cope with whole numbers and fractions or negative fractions .

Show the fractions on the number line if problems.

Revise meanings of numerator and denominator.

e) *Rule*: $-\frac{5}{10}\ \left(= \frac{1}{2}\right)$

Feedback for T

8 min

2

Book 4, page 69

Q.1 Read: *Continue the sequence for 3 more terms.*
What rule did you use?

Set a time limit. Encourage mental calculation. Ps do parts a) and b), then parts c) and d).

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

Extension

Who can continue the sequence for more terms?

Solution:

a) (740, 900, 1060, 1220, (1380, 1540, 1700,) [1860, 2020, 2180, 2340, . . .] *Rule*: + 160

b) 6561, 2187, 729, 243, (81, 27, 9,) $[3,\ 1,\ \frac{1}{3},\ \frac{1}{9},\ \frac{1}{27},\ ..]$ *Rule*: ÷ 3

c) 8900, 7900, 7000, 6200, (5500, 4900, 4400,)

[4000, 3700, 3500, 3400, 3400, 3500, 3600, . . .]

Rule: Difference between terms is decreasing by 100.

d) $\frac{2}{9},\ \frac{3}{9},\ \frac{4}{9},\ \frac{5}{9},\ (\ \frac{6}{9},\ \frac{7}{9},\ \frac{8}{9},)\ [\ \frac{9}{9},\ \frac{10}{9},\ \frac{11}{9},\ \frac{12}{9},\ \dots]$

$\frac{1}{3}$ $\frac{2}{3}$ 1 $1\frac{1}{9}$ $1\frac{2}{9}$ $1\frac{3}{9}$

Individual trial, monitored, helped

Written on BB or use enlarged copy master or OHP

(or c) and d) done with the whole class)

Discussion, reasoning, agreement, self-correction, praising

c) Sequence of differences:

– 1000, – 900, – 800, (– 700, – 600, – 500), [– 400, – 300, – 200, – 100, – 0, +100, . . .]

d) Rule: $+\frac{1}{9}$

Ps might give other forms of some of the fractions (as shown)

16 min

Bk4

Lesson Plan 69

Activity

Notes

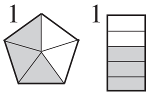
3

Explaining fractions

T writes a fraction on the BB. Who can explain what it means? Who can draw a diagram to show it? Who can show it another way? etc. Who can think of a problem about it? Class decides if it is suitable.

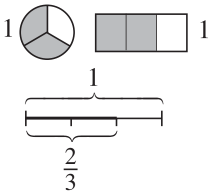
a) 3 fifths 'We divide the unit into 5 equal parts and take 3 of them'

(Ps draw a shape, divide it into fifths, then colour 3 of them.) BB: e.g.



b) $\frac{2}{3}$ 'We divide the unit into 3 equal parts and take 2 of them.'

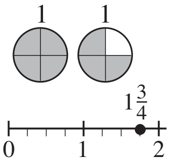
(Ps draw a shape, divide it into thirds, then colour 2 of them.) BB: e.g.



c) $1\frac{3}{4}$ 'We take 1 whole unit, then divide another unit into 4 equal parts and take 3 of them.' or

'We take 2 whole units, divide each of them into 4 equal parts, making 8 parts altogether, and take 7 of them.'

(Ps draw 2 congruent shapes and divide and colour appropriately.) BB: e.g.



Extension

Ps think of their own fraction, explain its meaning and draw a diagram about it (on BB or in *Ex. Bks*.). Who can think of a problem about it?

Whole class activity

(If class is not very able, T could have shapes already drawn on BB or OHT for Ps to divide up and colour.)

T helps with explanations and repeats suggested problems in a clearer way if necessary.

Ask Ps to point to the numerator and denominator of each fraction while explaining meaning.

Reasoning, agreement, praising

Extra praise for creative shapes.

Class checks that the parts whichhave been formed are equal.

Feedback for T

Whole class activity or individual work in *Ex. Bks*.

22 min

4

Book 4, page 69

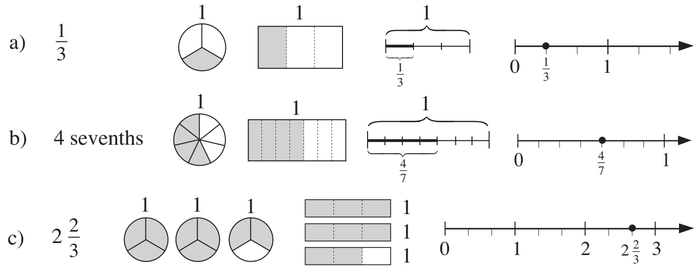
Q.2 Read: *Show the fractions in different ways.*

Set a time limit. If class is not very able, deal with one part at a time. Ps decide without help how to colour, draw or label. Ps finished first show their solutions on BB or OHT.

Review with whole class. Ps at BB explain their models. Who did the same? Who did something different? Is this correct too? etc. Deal with all cases. Class point out errors.

(Only praising and enouragement for part c) as it is difficult.)

Solution: e.g.



Elicit that $2\frac{2}{3} = 1 + 1 + \frac{2}{3} = \frac{3}{3} + \frac{3}{3} + \frac{2}{3} = \frac{8}{3}$

Individual work, monitored

Less able Ps helped with c)

Drawn on BB or use enlarged copy master or OHP

Reasoning, agreement, self-correction, praising

Reasoning: e.g.

c) '2 and 2 thirds means that I take 2 whole units, then divide up another unit into 3 equal parts and take 2 of them.'

or '2 and 2 thirds means that I take 3 whole units, divide each of them into 3 equal parts, making 9 equal parts altogether, and take 8 of them.'

28 min

Bk4

Lesson Plan 69

Activity

5

Book 4, page 69

Q.3 Let's have a calculation competition!

When I tell you to start, do the calculation in your *Ex. Bk*, check the result and write it in your *Pb*. You can draw a diagram if it will help you. Stand up when you have done it.

Start . . . now! T waits until majority of class are standing before choosing one of the quickest Ps to come to BB to explain reasoning to class. Class agrees/disagrees.

Who made a mistake? What was your mistake? Who did the same? etc. Ps correct their mistakes or complete the calculation.

Repeat for the other calculations.

Stand up if you had all 10 calculations correct (or 1, 2 mistakes if nobody has them correct). Let's give them a round of applause!

Solution:

a) 4100 + 810 + 70 + 2400 = 4980 + 2400 = <u>7380</u>

$$\begin{array}{ccccc} & 4 & 1 & 0 & 0 \\ & & 8 & 1 & 0 \\ & & & 7 & 0 \\ + & 2 & 4 & 0 & 0 \\ \hline & 7 & 3 & 8 & 0 \\ & {\scriptstyle 1} & & & \end{array}$$

b) 5210 – 2300 = <u>2910</u>

$$\begin{array}{ccccc} & 5 & 2 & 1 & 0 \\ - & 2 & 3 & 0 & 0 \\ \hline & 2 & 9 & 1 & 0 \end{array}$$

c) 3050 – 2500 + 800 = 550 + 800 = <u>1350</u> or

$$\begin{array}{ccccc} & 3 & 8 & 5 & 0 \\ - & 2 & 5 & 0 & 0 \\ \hline & 1 & 3 & 5 & 0 \end{array}$$

d)

$$\begin{array}{ccccc} & & & {\scriptstyle 2} & \\ & 7 & 0 & 2 & 8 \\ & 1 & 6 & 3 & 5 \\ + & & 2 & 0 & 7 \\ \hline & 8 & 8 & 7 & 0 \end{array}$$

e)

$$\begin{array}{ccccc} & 5 & 6 & 1 & 7 \\ - & 4 & 2 & 0 & 5 \\ \hline & 1 & 4 & 1 & 2 \end{array}$$

f)

$$\begin{array}{ccccc} & 6 & 1 & 0 & 8 \\ - & 3 & 7 & 2 & 6 \\ \hline & 2 & 3 & 8 & 2 \end{array}$$

g) 2 sixths + 3 sixths = <u>5 sixths</u> or $\frac{2}{6} + \frac{3}{6} = \frac{5}{6}$

h) 7 eighths – 3 eighths = <u>4 eighths</u> or $\frac{7}{8} - \frac{3}{8} = \frac{4}{8} = \frac{1}{2}$

i) $\frac{5}{12} + \frac{1}{12} + \frac{3}{12} = \frac{9}{12} = \frac{3}{4}$

j) $\frac{9}{10} - \frac{3}{10} = \frac{6}{10} = \frac{3}{5}$

38 min

Notes

Individual work, monitored (helped)

Written on BB or OHT

Deal with one part at a time unless class is very able.

(Some Ps might not need to use their *Ex. Bks*.)

In good humour!

Reasoning, agreement, self-correcting, praising

Ps explain calculations in detail or draw models on BB to show the fractions if there are problems.

Use different Ps to explain each time.

Stars, stickers, etc. awarded

Activity

6

Book 4, page 69

Q.4 Set a time limit. Ps do calculations in *Ex. Bks* if necessary, then write the results in *Pbs*. T writes extra questions f) and g) on BB for Ps to try in *Ex. Bks* if they wish and have time.

BB: f) 1037 × 13 = g) 5555 ÷ 7 =

Review a) to e) at BB with whole class. Ps could show results on slates in unison on command. Ps responding incorrectly work through solution on BB with help of other Ps. Mistakes discussed and corrected.

Ps who tried f) and g) come to BB to explain their reasoning. Ps might show different methods of calculating. Accept and praise all correct methods.

Solution:

a) i) 40 × 3 = <u>120</u> ii) 280 ÷ 7 = <u>40</u> iii) 30 × 30 = <u>900</u>

b)

	8	7
	×	6
5	2	2
	4	

c)

	7	3	6
		×	9
6	6	2	4
	3	5	

d)

	1	4	r 3
6	8	7	
	2	③	

e)

		8	1	r 7
9	7	3	6	
		1	⑦	

f)*

		1	0	3	7
			×	1	3
		3	1	1	1
+	1	0	3	7	0
	1	3	4	8	1

g)*

		7	9	3	r 4
7	5	5	5	5	
		6	2	④	

or

		7	9	3	r 4
7	5	5	5	5	
−	4	9			
		6	5		
	−	6	3		
			2	5	
		−	2	1	
				④	

45 min

Notes

Individual work, monitored, helped

Written on BB or SB or OHT

Differentiation by time limit and optional questions.

Reasoning, agreement, self-correction, praising

Discussion, reasoning, agreement, self-correcting, praising

Other methods: e.g.

f) 1037 × 13
= 1037 × 10 + 1037 × 3
= 10 370 + 3000 + 90 + 21
= 13 370 + 111
= <u>13 481</u>

g) subtracting known multiples:

7	5	5	5	5			
−	3	5	0	0	5	0	0
	2	0	5	5			
−	1	4	0	0	2	0	0
		6	5	5			
	−	3	5	0		5	0
		3	0	5			
	−	2	8	0		4	0
			2	5			
		−	2	1			3
				④	7	9	3

Bk4

R: Mental and written calculation

C: Revision and practice: Whole numbers and fractions

E: Inequalities

Lesson Plan 70

Activity | ***Notes***

1

Calculation practice

Listen carefully, do the calculations in your head if you can and show me the answer when I say.

a) *Start with 352, add 450* (802), . . . *subtract 142* (660), . . . *divide by 3* (220), . . . *multiply by 5* (1100) , . . . *multiply by 10* (11000), . . . *and divide by 1000.*

Which number do you end up with? Show me . . . now! (11)

Ps who were wrong go through the calculations with help of class.

b) *I am thinking of a number. If I add 840 to it and take away 320, I get 1520. What is the number I am thinking of?*

Show me . . . now! (1000)

A, come and tell us how you got your answer. Who agrees? Who did it another way? etc.

e.g. $\square + 840 - 320 = 1520$

$\square + 520 = 1520$, so $\square = 1520 - 520 = \underline{1000}$

c) *I am thinking of a number. If I multiply 1 third of it by 6, I get 1200. What is the number I am thinking of?*

Show me . . . now! (600)

B, come and tell us how you got your answer. Who agrees? Who did it another way? etc.

e.g. $\square \div 3 \times 6 = 1200$ or $\square \times 2 = 1200$

$\square = 1200 \div 6 \times 3$ $\quad$ $\square = 1200 \div 2 = \underline{600}$

$= 200 \times 3 = \underline{600}$

8 min

Whole class activity

T gives Ps time to calculate between each step. Subtotals can be written on scrap paper, slates or in *Ex. Bks* if Ps cannot keep them in mind.

Responses written on scrap paper or slates and shown in unison

Discussion, reasoning. checking, agreement, praising

Or a letter could be used for the unknown number, e.g.

$x + 840 - 320 = 1520$, etc.

Agree that to find the unknown number, the <u>opposite</u> operations are done in the <u>reverse</u> order.

Elicit that dividing by 3 and then multiplying by 6 is the same as multiplying by 2.

Praising, encouragement only

Feedback for T

2

Inequalities

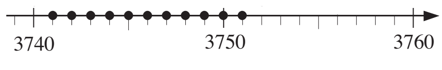
a) Which numbers can be written in the box? Ps come to BB to list them or dictate to T. Class agrees/disagrees.

BB: $3740 < \square < 3752$

$\square$: 3741, 3742, 3743, 3744, 3745, 3746, 3747, 3748, 3749, 3750, 3751 (if only whole numbers)

Let's mark them on the number line. Ps draw dots at each tick.

BB:

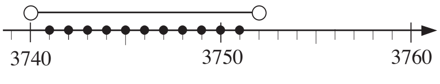


Could any other numbers be included? If Ps do not think of fractions, T gives a hint, e.g., 'What about 3748 and a half?' P comes to number line to mark its position.

We call numbers made up of a whole number and a fraction <u>mixed numbers</u>. (BB) Who can think of other mixed numbers which could be included in our list? (e.g. e.g. 3750 and 9 tenths.)

We don't have room to mark <u>all</u> the possible numbers with dots. Who remembers how we can show them? P comes to BB.

BB:



Elicit that 3740 and 3752 should not be included in the list, so the circles above them are left white (or open).

Whole class activity

Drawn on BB or use enlarged copy master or OHP

A a good pace

Agreement, praising

Discussion, agreement, praising

BB: <u>Mixed numbers</u>

e.g. $3\frac{1}{4}$, $27\frac{3}{8}$, $3750\frac{11}{20}$

'We draw a circle above the numbers at each side of the inequality, then join them up with a straight line.'

(T gives hints or shows it if no P remembers.)

Activity

Notes

2

(Continued)

b) Deal with this inequality in a similar way, elicit ing that:

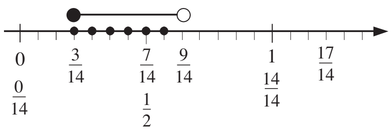
- other fractions can be included in the list too;
- 3 fourteenths <u>should</u> be included in the list, so the circle above it is coloured *black*.

BB:

$\frac{3}{14} \leq \square < \frac{9}{14}$

$\square$: $\frac{3}{14}$, $\frac{4}{14}$, $\frac{5}{14}$, $\frac{6}{14}$, $\frac{7}{14}$, $\frac{8}{14}$

(If only fourteenths are used)



Discussion, reasoning, agreement, praising

BB: e.g. $\frac{6}{28} \leq \boxed{\frac{17}{28}} < \frac{18}{28}$

Ps suggest other possible fractions and show their rough position on the number line.

Discuss equivalent fractions (some given in the diagram).

14 min

3

Book 4, page 70

Q.1 Read: *Write an equation and calculate the missing number in your exercise book.*

Set a time limit. Ps read questions themselves and solve and check them in *Ex. Bks*.

Review at BB with whole class. (Ps could show each result on scrap paper or slates in unison on command. P responding correctly explains to those who did not.) Mistakes discussed and corrected.

Solution: (e.g. using a square for the unknown number)

a) *We thought of a number. If we added 420 we would get 3150. Which number were we thinking of?*

■ + 420 = 3150, ■ = 3150 – 420 = <u>2730</u>

b) *We thought of a number. If we subtracted 200 from it we would get 5002. Which number were we thinking of?*

■ – 200 = 5002, ■ = 5002 + 200 = <u>5202</u>

c) *We thought of a number. If we multiplied it by 7 we would get 203. Which number were we thinking of?*

■ × 7 = 203 ■ = 203 ÷ 7 = <u>29</u>

d) *We thought of a number. If we divided it by 7 we would get 203. Which number were we thinking of?*

■ ÷ 7 = 203 ■ = 203 × 7 = <u>1421</u>

Individual work, monitored, helped

(Or as a whole class activity. P reads a question aloud, Ps solve it in *Ex. Bks* and show the result on T's command.)

Ps check by doing reverse operations.

Discussion, reasoning, self-correction, praising

Show details of calculations on BB if problems. e.g.

a)

$$\begin{array}{rcccc} & 3 & 1 & 5 & 0 \\ - & & 4 & 2 & 0 \\ \hline & 2 & 7 & 3 & 0 \end{array}$$

c)

$$\begin{array}{c|ccc} & & 2 & 9 \\ \hline 7 & 2 & 0 & 3 \\ & & 6 & \end{array}$$

d)

$$\begin{array}{cccc} & 2 & 0 & 3 \\ & & \times & 7 \\ \hline 1 & 4 & 2 & 1 \\ & & 2 & \end{array}$$

22 min

4

Book 4, page 70

Q.2 Read: *Fill in the missing numbers.*

Set a time limit. Ps can do calculations in *Ex.Bks*.

Review at BB with whole class. Ps come to BB or dictate to T, explaining reasoning. Who agrees? Who did it another way? etc.

Solution:

a) 438 + <u>562</u> = 1000

b) <u>7400</u> – 4500 = 2900

c) 8200 – <u>5400</u> = 2800

d) $\frac{3}{8} + \boxed{\frac{4}{8}} = \frac{7}{8}$

e) $\boxed{\frac{13}{15}} - \frac{2}{15} = \frac{11}{15}$

f) $1 - \boxed{\frac{3}{7}} = \frac{4}{7}$

Individual work, monitored (helped)

Written on BB or use enlarged copy master or OHP

Reasoning, agreement, self-correcting, praising

Details of reasoning:

a) $\square$ = 1000 – 438 = <u>562</u>

b) $\square$ = 2900 + 4500 = <u>7400</u>

c) $\square$ = 8200 – 2800 = <u>5400</u> etc.

28 min

Bk4

Lesson Plan 70

Activity | ***Notes***

5

Book 4, page 70

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

Set a time limit. Ps do calculations in *Ex. Bks* and write only the results in *Pbs*.

Review at BB with whole class. Ps come to BB or dicatate to T, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected. Show details of calculations on BB if problems.

Solution:

a) $9 \times \underline{43} = 387$ (as $387 \div 9 = 43$)

b) $\underline{3483} \div 9 = 387$ (as $387 \times 9 = 3483$)

c) $378 \div \underline{54} = 7$ (as $378 \div 7 = 54$)

d) $\frac{1}{3} \times 3 = \boxed{\frac{3}{3}}$ (= 1) (as $\frac{1}{3} + \frac{1}{3} + \frac{1}{3} = \frac{3}{3} = 1$)

e) $\boxed{\frac{4}{5}} \div 2 = \frac{2}{5}$ (as $\frac{2}{5} \times 2 = \frac{4}{5}$)

f) $\frac{5}{8} \div \underline{5} = \frac{1}{8}$ (as $\frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} = \frac{1}{8} \times 5 = \frac{5}{8}$)

34 min

Individual work, monitored, helped

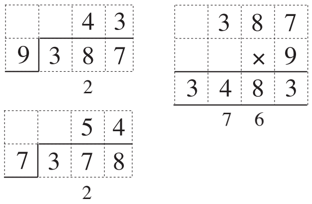
Written on BB or SB or OHT

(Or deal with one row at a time and do d), e) and f) with the whole class)

Discussion, reasoning, agreement, self-correction, praising

Extra praise if Ps do d), e) and f) without T's help.

Details: e.g.



6

Book 4, page 70, Q.4

a) Read: *Complete the table if this is the rule. B = 2 thirds of A*
Write the rule in a different way.

Ps come to BB to choose a column and write the missing number, explaining reasoning. Class agrees/disagrees. T might need to help with the columns which have fractions. Draw a diagram to help Ps understand the relationship between *A* and *B*.

Who can write the rule in a different way? Who agrees? Who can think of another way? etc. Check with values from the table.

Solution:

A	3	6	9	12	15	18	21	24	27	30	33	**36**	**39**	**42**	**45**	450	**105**	$\frac{3}{4}$	$\mathbf{\frac{3}{5}}$	$\mathbf{7\frac{1}{2}}$
B	2	4	**6**	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	24	26	28	30	**300**	70	$\mathbf{\frac{2}{4}}$	$\frac{2}{5}$	5

Rule: $B = \frac{2}{3}$ of A or $B = A \div 3 \times 2$,

A = 3 halves of B or $A = B \div 2 \times 3$ or $A = B + (B \div 2)$

b) Read: *Find a rule and complete the table. Write the rule in different ways.*

Ask several Ps what they think the rule could be. Decide on one form in words. Ps come to BB to choose a column and write the missing number, explaining reasoning Class agrees/disagrees. Ps think of their own values for the last 3 columns.

Who can write the rule in a mathematical way? Who agrees? Who can write it another way? Check with values from the table.

Solution:

X	1	2	$\frac{3}{5}$	$\frac{4}{5}$	$\mathbf{\frac{6}{5}}$	$1\frac{2}{5}$	$\frac{13}{5}$	$\mathbf{\frac{9}{5}}$	**6**	20	$\mathbf{40\frac{3}{5}}$			
Y	$\frac{2}{5}$	$1\frac{2}{5}$	0	$\frac{1}{5}$	$\frac{3}{5}$	$\mathbf{\frac{4}{5}}$	$\mathbf{\frac{10}{5}}$	$\frac{6}{5}$	$5\frac{2}{5}$	$\mathbf{19\frac{2}{5}}$	40			

Rule: $Y = X - \frac{3}{5}$, $X = Y + \frac{3}{5}$, $X - Y = \frac{3}{5}$

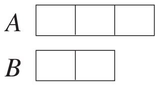
45 min

Whole class activity

(or some items individually if Ps wish)

Tables drawn on BB or use enlarged copy master or OHP

BB: e.g.



Reasoning, agreement, praising

Discussion on the rule, agreement, checking, praising

Discussion, agreement on the rule, e.g. 'Each number in the top row is three fifths more than the number in the bottom row'.

Ps come to BB in pairs to write values for the last 3 columns. Class checks that they are correct.

Extra praise if Ps notice that some fractions can be written as mixed numbers.

Bk4

R: Mental and written calculations
C: Review and practice. Whole numbers and fractions
E: Problems. Quantities

Lesson Plan
71

Activity

Notes

1

Rounding to nearest metre

Who can tell me the units of length? (km, m, cm, mm) What is their relationship to each other? (BB)

Let's round these lengths to the nearest whole metre. Ps come to BB or dictate what T should write, explaining reasoning. Class agrees/ disagrees.

BB:
a) 670 cm $\approx$ (7 m) b) 1515 cm $\approx$ (15 m)
c) 850 cm $\approx$ (9 m) d) 6040 cm $\approx$ (60 m)
e) 449 cm $\approx$ (4 m) f) 7100 cm = (71 m)
g) 5492 mm $\approx$(5 m) h) 8920 mm $\approx$ (9 m)
i) 26 cm $\approx$ (0 m) j) $1\frac{1}{2}$ m $\approx$ (2 m)

6 min

Whole class activity

Written on BB or SB or OHT

BB: 1 km = 1000 m
1 m = 100 cm = 1000 mm
1 cm = 10 mm

At a good pace

Reasoning, agreement, praising

Elicit that:
values < 50 cm round <u>down</u>
values $\geq$ 50 cm round <u>up</u>

Feedback for T

2

Capacity

What is capacity? (How much liquid a container can hold) Who can tell me the units of capacity? (litre, cl, ml) What is their relationship to one another? (BB)

Which unit of capacity is missing from these sentences? Ps come to BB to write the missing units and to read the whole sentence aloud. Who agrees? Who thinks it should be another unit? Why? etc.

BB:
a) A large bucket can hold 12 $\overset{\text{(litres)}}{\dots\dots\dots}$ of water when it is full.
b) 12 $\overset{\text{(cl)}}{\dots\dots}$ of water will fill a small glass.
c) A tablespoon can hold 12 $\overset{\text{(ml)}}{\dots\dots}$ of water.

10 min

Whole class activity

BB:
1 litre = 100 cl = 1000 ml
1 cl = 10 ml

Written on BB or SB or OHT

Agreement, praising

(T could have such items to show to class.)

Feedback for T

3

Rounding to nearest litre

T says a capacity and writes it on the BB. Ps round it to the nearest whole litre and show on scrap paper or slates on command. Ps who answered correctly explain to those who did not.

BB:
a) 432 cl $\approx$ (4 litres) b) 350 cl $\approx$ (4 litres)
c) 996 cl $\approx$ (10 litres) d) 2546 ml $\approx$ (3 litres)
e) 1200 ml $\approx$ (1 litre) f) 2500 ml $\approx$ (3 litres)
g) 25 cl $\approx$ (0 litres) h) 96 ml $\approx$ (0 litres)
i) 760 ml $\approx$ (1 litre) j) $1\frac{3}{4}$ litres $\approx$ (2 litres)

15 min

Whole class activity

In unison

Reasoning, agreement, praising

Elicit that:
values < 50 cl (or 500 ml) round <u>down</u>

values $\geq$ 50 cl (or 500 ml) round <u>up</u>

Feedback for T

Bk4

Lesson Plan 71

Activity

Notes

4

Mass

What is mass? (How heavy something is) Who can tell me the units of mass? (tonne, kg, g). What is their relationship to one another? (BB)

Which unit of mass is missing from these sentences? Ps come to BB to write the missing units and to read the whole sentence aloud. Who agrees? Who thinks it should be another unit? Why? etc.

BB: e.g.

a) The mass of a small packet of cream cheese is 100 .... (grams)

b) The mass of a lorry carrying a load of sand is 10 .... (tonnes)

c) The mass of a bucket full of water is 10 ..... (kg) ...

d) The mass of a sweet is 10 .... (grams)

20 min

Whole class activity

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

Written on BB or SB or OHT

Agreement, praising

(T could have items for a) and d) to show to class. Amend the sentences to match the items.)

Feedback for T

5

Rounding mass

a) Let's round these quantities to the nearest kg.

BB: i) 1625 g ≈ (2 kg) ii) 3200 g ≈ (3 kg)
iii) 7500 g ≈ (8 kg) iv) 900 g ≈ (1 kg)

b) Let's round these quantities to the nearest tonne.

BB: i) 1200 kg ≈ (1 tonne) ii) 1500 kg ≈ (2 tonnes)
iii) 1498 kg ≈ (1 tonne) iv) 498 kg ≈ (0 tonnes)

25 min

Whole class activity

Written on BB or SB or OHT

Ps come to BB or dictate to T, explaining reasoning.

Class agrees/disagrees.

Elicit that:

values < 500 g round down
values ≥ 500 g round up

Feedback for T

6

Book 4, page 71

Q.1 Read: *Solve this problem in your exercise book. Write the answer here.*

Ps read question themselves, calculate and check in *Ex. Bks* and write the answers in *Pbs*. Set a time limit.

Review with whole class. Ps come to BB to explain solution. Class agrees/disagrees. Mistakes discussed and corrected.

Solution:

A roll of film is 675 m long.

a) How long are 9 rolls of film?

BB: 1 roll → 675 m
9 rolls → 675 m × 9 = 6075 m (= 6 km 75 m)

b) How long is 3 fifths of a roll of film?

BB: 1 fifth of a roll → 675 m ÷ 5 = 135 m
3 fifths of a roll → 135 m × 3 = 405 m

or 3 fifths of a roll → 675 m ÷ 5 × 3 = 405 m

30 min

Individual work, monitored, helped

If possible, T could have a real camera and a roll of film to show to class.

Discussion, reasoning. agreement, self-correction, praising

Show details of calculations on BB if problems:

a)

	6	7	5
		×	9
6	0	7	5
	6	4	

b)

	1	3	5
5	6	7	5
	1	2	

1	3	5
	×	3
4	0	5
1	1	

Activity

Notes

7

Book 4, page 71

Q.2 Read: *Complete the table.*

Study the table. Who can explain what we have to do? If nobody understands, do one or two rows with the whole class first as a model for Ps to follow. Set a time limit.

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

Solution:

Capacity	100 litres	800 litres	1 litre	8 litres	10 cl	80 cl
1 half	50 ℓ	400 ℓ	50 cl	400 cl	50 ml	400 ml
1 quarter	25 ℓ	200 ℓ	25 cl	200 cl	25 ml	200 ml
1 tenth	10 ℓ	80 ℓ	10 cl	80 cl	10 ml	80 ml
1 fifth	20 ℓ	160 ℓ	20 cl	160 cl	20 ml	160 ml
2 fifths	40 ℓ	320 ℓ	40 cl	320 cl	40 ml	320 ml
3 tenths	30 ℓ	240 ℓ	30 cl	240 cl	30 ml	240 ml

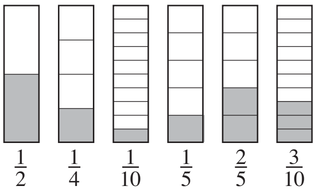
35 min

Individual work, monitored, helped

Drawn on BB or use enlarged copy master or OHP

Discussion, reasoning, agreement, self-correction, praising

Draw diagrams on BB if there are problems. e.g.



8

Book 4, page 71

Q.3 Read: *Complete the table.*

Elicit that this table is similar to Q.2 but that the measures are for mass and the fractions are written with numbers.

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

Solution:

Mass	1 kg	12 kg	24 kg	200 g	400 g	6 tonnes
$\frac{1}{2}$	500 g	6000 g	12 000 g	100 g	200 g	3000 kg
$\frac{1}{4}$	250 g	3000 g	6000 g	50 g	100 g	1500 kg
$\frac{1}{10}$	100 g	1200 g	2400 g	20 g	40 g	600 kg
$\frac{1}{5}$	200 g	2400 g	4800 g	40 g	80 g	1200 kg
$\frac{2}{5}$	400 g	4800 g	9600 g	80 g	160 g	2400 kg

40 min

Individual work, monitored, helped

Drawn on BB or use enlarged copy master or OHP

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

What is the largest (smallest) mass anywhere in the table?

(Largest: 6 tonnes = 6000 kg
Smallest: 20 g)

9

Book 4, page 71, Q.4

Read: *Complete the tables to show the capacity and mass of clear water at 4 °C.*

Remind Ps of the relationship between capacity and mass by measuring out 1 litre of water and weighing it.or balancing it against a 1 kg weight.

Ps come to BB to choose a column and fill in the missing quantity, explaining reasoning. Class agrees/disagrees. Ps fill in tables in *Pbs* too.

Solution:

a)

Capacity	1 litre	7 litres	**4 litres**	$\frac{1}{2}$ litre	**$\frac{1}{4}$** ℓ	100 ℓ	**50 litres**	$\frac{3}{4}$ litre
Mass	1 kg	**7 kg**	4 kg	**500** g	250 g	**100 kg**	50 kg	**750** g

b)

Capacity	1 ml	8 ml	**13 ml**	1 cl	**10 ml**	200 ml	**50 ml**	$1\frac{1}{2}$ ml
Mass	1 g	**8 g**	13 g	**10 g**	10 g	**200 g**	50 g	**$1\frac{1}{2}$ g**

45 min

Whole class activity

Drawn on BB or use enlarged copy master or OHP

(Demonstrate 1 or 2 different weights and capacities if time.)

BB: 1 litre → 1 kg = 1000 g
1 cl → 10 g
1 ml → 1 g

Discussion, reasoning, agreement, praising

Elicit other ways to write some quantities, e.g.

1 quarter of a litre = 25 cl

50 ml = 5 cl, etc.

Bk4

R: Mental and written calculations
C: Review and practice: Whole numbers and fractions
E: Problems

Lesson Plan *72*

Activity

Notes

1

Factors

Let's factorise these numbers and write them as a product of their prime factors. We can then use the prime factors to help us list all the factors of each number.

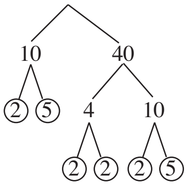
Ps come to BB to draw the factor trees and write a multiplication. Class points out errors. Then the class dictates the factor pairs, using the prime factors to help them (see example in c) below).

If Ps do not dictate the factors in order, T makes sure that they are written in order on the BB, either horizontally or vertically.

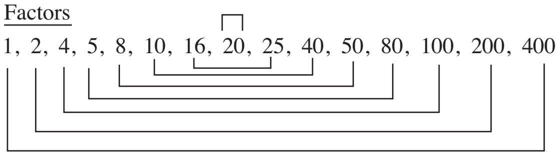
BB: e.g.

a) Prime factors

$400 = 2 \times 2 \times 2 \times 2 \times 5 \times 5$

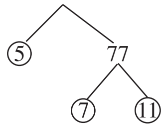


Factors

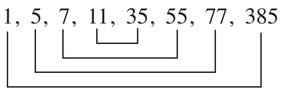


b) Prime factors

$385 = 5 \times 7 \times 11$



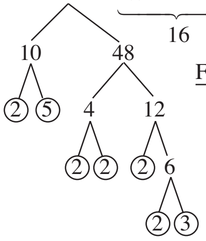
Factors



c) Prime factors

$480 = \underbrace{2 \times 2 \times 2 \times 2}_{16} \times \underbrace{2 \times 3 \times 5}_{30}$

e.g.



Factors

1	2	3	4	5	6	8	10	12	15	$\boxed{16}$	20
480	240	160	120	96	80	60	48	40	32	$\boxed{30}$	24

Whole class activity

First elicit what a factor and a prime factor are.

(A factor of a whole number divides into that number exactly, or multiplies another whole number to make that number.

A prime factor is a factor which is a prime number, i.e. it has 2 factors, itself and 1.)

Note

1 is not a prime number as it has only 1 factor, 1.

Ps could list the prime numbers orally at speed in order round class:

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, . . .

At a good pace

Agreement, praising

(Ps could use a calculator to check the factor pairs.)

10 min

2

Problem 1

Listen carefully, picture the story in your head and solve the problem in your *Ex. Bks*. Drawing a diagram might help you.
Show me the answer when I say.

I had a piece of ribbon which measured 3 halves of a metre.
I cut 3 tenths of a metre from one end. What length of ribbon do I have left? Show me . . . now! (On scrap paper or slates) (120 cm)

P who responded correctly comes to BB to show solution, explaining reasoning. Who did the same? Who did it a different way? etc. Mistakes discussed and corrected.

BB: e.g. Had: 3 halves of a metre = 100 cm ÷ 2 × 3 = 150 cm
Cut off: 3 tenths of a metre = 100 cm ÷ 10 × 3 = 30 cm
Had left: 150 cm – 30 cm = 120 cm

or $\frac{3}{2} - \frac{3}{10} = \frac{15}{10} - \frac{3}{10} = \frac{12}{10} = 1\frac{2}{10}$ (m) = $\underline{120 \text{ cm}}$

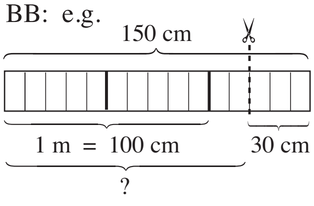
Individual work, monitored, helped (or whole class activity)

T repeats problem slowly and writes fractions on BB.

Had: $\frac{3}{2}$ m Cut off: $\frac{3}{10}$ m

Reasoning, agreement, self-correction, praising

BB: e.g.



Answer: I had 120 cm left.

15 min

Bk4

Lesson Plan 72

Activity

Notes

3

Problem 2

Listen carefully, write the data, make a plan and do the calculation in your *Ex. Bks*. Show me the answer when I say.

Donna took one and a half hours to do her homework.
She spent 2 fifths of that time reading.
For how long was she reading?

Show me . . . now! (36 min.)

P who answered correctly comes to BB to explain his/her solution. Class agrees/disagrees. Mistakes discussed and corrected.

BB: e.g.

Time on homework: $1\frac{1}{2}$ hours = 60 min + 30 min = 90 minutes

Time reading: $\frac{2}{5}$ of 90 minutes = 90 min. ÷ 5 × 2 = 18 min × 2

= <u>36 min.</u>

Answer: She read for 36 minutes.

Individual work, monitored helped

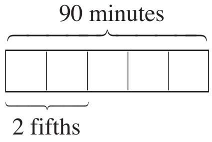
(or whole class activity)

T repeats slowly to give Ps time to think and calculate.

On scrap paper or slates in unison

Reasoning, agreement, self-correcting, praising

BB: e.g.



20 min

4

Problem 3

Listen carefully and think how you would solve this problem.

A lorry was loaded with 4590 kg of wheat, which was 2 ninths of the total crop. How much wheat was in the total crop?

Ps decide what to do first and how to continue. Ps come to BB to write a plan and do the calculations, explaining reasoning. Class points out errors. Who can think of another way to do it? etc.

BB: e.g. $\frac{2}{9}$ of the crop → 4590 kg

$\frac{1}{9}$ of the crop → 4590 kg ÷ 2 = 2295 kg

$\frac{9}{9}$ of the crop → 2295 kg × 9 = <u>20 655 kg</u>

Or in one line:

Whole crop = $\frac{9}{9}$ → 4590 kg ÷ 2 × 9 = 2295 kg × 9 = <u>20 655 kg</u>

Answer: There were 20 655 kg of wheat in the whole crop.

Whole class activity

(or individual work if Ps wish)

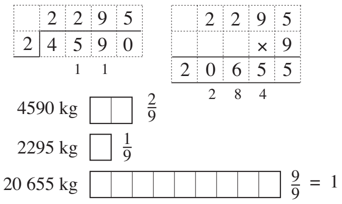
Make sure that Ps understand the context.

Allow Ps to decide on plan and calculations.

Reasoning, agreement, correction where necessary, praising, encouragement only

Draw a diagram if Ps have not already done so,.

BB: e.g.



25 min

5

Book 4, page 72

Q.1 Read: *Fill in the missing numbers.*

Set a time limit. Ps may do calculations in *Ex. Bks* if needed but encourage mental calculation.

Review at BB with whole class. T reads each calculation and Ps show their final result on scrap paper or slates on command. Ps who responded correctly explain at BB to those who did not. Mistakes discussed and corrected

What do you notice? [e.g. a) and b) are really the same calculation but done in a different order – the results are the same. Similarly for d) and e).]

Individual work, monitored

Written on BB or use enlarged copy master or OHP

Differentiation by time limit

Discussion, reasoning, agreement, self-correcting, praising

Note that in c):

+ 400 + 300 = + 700
– 500 – 200 = – 700

and that + 700 – 700 = 0

Activity		*Notes*

5

(Continued)

Solution:

a) $5600 \xrightarrow{+400} \boxed{6000} \xrightarrow{+500} \boxed{6500} \xrightarrow{+300} \boxed{6800} \xrightarrow{+200} \boxed{\mathbf{7000}}$

b) $5600 \xrightarrow{+500} \boxed{6100} \xrightarrow{+200} \boxed{6300} \xrightarrow{+400} \boxed{6700} \xrightarrow{+300} \boxed{\mathbf{7000}}$

c) $5600 \xrightarrow{+400} \boxed{6000} \xrightarrow{-500} \boxed{5500} \xrightarrow{+300} \boxed{5800} \xrightarrow{-200} \boxed{\mathbf{5600}}$

d) $5600 \xrightarrow{-400} \boxed{5200} \xrightarrow{-500} \boxed{4700} \xrightarrow{-300} \boxed{4400} \xrightarrow{-200} \boxed{\mathbf{4200}}$

e) $5600 \xrightarrow{-300} \boxed{5300} \xrightarrow{-200} \boxed{5100} \xrightarrow{-400} \boxed{4700} \xrightarrow{-500} \boxed{\mathbf{4200}}$

Liken the operations to a bank account which has £5600 in it at the start, so that, e.g. in

d) money is taken out in small amounts:

$- 400 - 500 - 300 - 200$

$= -(400 + 500 + 300 + 200)$

$= -1400$ (altogether)

$5600 - 1400 = \underline{4200}$

Similarly for e).

30 min

6

Book 4, page 72

Q.2 Read: *Write a plan, estimate, calculate, check and write the answer as a sentence in your exercise book.*

Deal with one at a time. Ps read problem themselves and solve it. Set a time limit.

Review with the whole class. Ps could show results on scrap paper or slates. Ps answering correctly come to BB to explain to the others. Who agrees? Who did it a different way? Who made a mistake? What was your mistake? etc.

Solutions:

a) *A farmer colllected the cherries from his orchard and packed them in boxes. Each box held 18 kg of cherries.*

He filled 79 boxes and loaded them on a lorry to take to the supermarket.

If an empty box weighed 2 kg, what was the total load on the lorry?

e.g. 1 box + cherries: 2 kg + 18 kg = 20 kg

79 boxes + cherries: 20 kg × 79 = 20 kg × 80 – 20 kg

= 1600 kg – 20 kg

= $\underline{1580\text{ kg}}$

or 79 boxes + cherries = 79 × 2 kg + 79 × 18 kg

= 158 kg + 1422 kg

= $\underline{1580\text{ kg}}$

Answer: The total load on the lorry was 1580 kg.

b) *The total mass of 8 containers of building material is 5600 kg. If the containers weighed 1600 kg in total when they were empty, how much building material is in each container?*

e.g. Material in 8 containers: 5600 kg – 1600 kg = 4000 kg

Material in 1 container: 4000 kg ÷ 8 = $\underline{500\text{ kg}}$

or 1 full container: 5600 kg ÷ 8 = 700 kg

1 empty container: 1600 kg ÷ 8 = 200 kg

Material in 1 container: 700 kg – 200 kg = $\underline{500\text{ kg}}$

Answer: Each container holds 500 kg of building material.

35 min

Individual work, monitored, helped

Ps can collaborate with their neighbours if they wish.

Discussion, reasoning, agreement, self-correction, praising

or

(2 + 18) × 79 = 20 × 79

= 1580 (kg)

BB:

		7	9	
	×	1	8	
	6	3	2	(× 8)
+	7	9	0	(× 10)
1	4	2	2	
	1			

or (5600 – 1600) ÷ 8

= 4000 ÷ 8 = $\underline{500}$ (kg)

or 5600 ÷ 8 – 1600 ÷ 8

= 700 – 200 = $\underline{500}$ (kg)

Deal with all the methods used by Ps.

Bk4

Lesson Plan 72

Activity		*Notes*

7

Book 4, page 72

Q.3 a) Read: *How many small squares are needed to cover this rectangle?*

Stand up when you know it! First P to stand gives the total and explains how he got it so quickly (e.g. 4 × 9 = <u>36</u>)

b) Read: *Draw a rectangle which needs*

i) half ii) 2 thirds iii) 3 quarters iv) 5 ninths

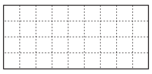
of this number of small squares to cover it.

Ps calculate first (in *Ex. Bks* or on slates if necessary), then draw the rectangle and write the number of squares inside it.

Review at BB with whole class. Ps dicatate the number of squares and come to BB to draw a rectangle (or T has a solution already prepared and uncovers each rectangle as it is dealt with). Elicit that the number of squares is its <u>area</u>.

Solution:

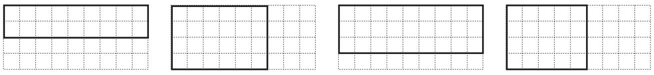
a)



<u>36</u> small squares

b)

i) $\frac{1}{2}$ ii) $\frac{2}{3}$ iii) $\frac{3}{4}$ iv) $\frac{5}{9}$



36 ÷ 2 = 18 36 ÷ 3 × 2 = 24 36 ÷ 4 × 3 = 27 36 ÷ 9 × 5 = 20

Extension

What fraction of the 36 small squares could make a larger square?

Individual work, monitored, helped

Grids drawn on BB or use enlarged copy master or OHP

Discussion, reasoning, agreement, self-correction, praising

Elicit other possible rectangles e.g.

i) 6 × 3, 18 × 1

ii) 8 × 3, 2 × 12, 24 × 1

iii) 27 × 1

iv) 2 × 10, 20 × 1

but some cannot fit on the given grids.

1 quarter, 1 ninth, 4 ninths
(3 × 3) (2 × 2) (4 × 4)

40 min

8

Book 4, page 72, Q.4

Read: *Complete the table to show different parts of the total number of walnuts.*

T could have some real walnuts to show to class. How are they grown? Where do they come from? etc. Who has never tasted a walnut? (T cracks one open and lets such Ps taste the kernel.)

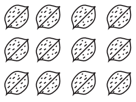
How many walnuts are in the picture altogeher? (3 × 4 = <u>12</u>)

Let's complete the table. Ps come to BB to choose a column and fill in the missing number, explaining reasoning. Class agrees/disagrees.

Ps complete the table in their *Pbs* too.

Solution:

Part of total	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{3}{2}$	$\frac{3}{3}$	$\frac{3}{6}$	$\frac{2}{3}$	$\frac{4}{6}$	$\frac{6}{3}$
Number of	6	4	2	18	12	6	8	8	24



Whole class activity
(or individual work if Ps wish)

Drawn on BB or use enlarged copy master or OHP

[e.g.Walnuts grow on trees in America, SE Europe and Asia; the wood from the trunk is used to make furniture]

At a good pace

Reasoning, agreement, praising

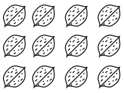
Extension

If these 12 walnuts were <u>not</u> the whole amount but were the fractions shown in the table, what would the whole amount be?

T points to each fraction in turn and class shouts out the whole amount.

BB:

Part of total	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{3}{2}$	$\frac{3}{3}$	$\frac{3}{6}$	$\frac{2}{3}$	$\frac{4}{6}$	$\frac{6}{3}$
Total no. of	24	36	72	8	12	24	18	18	6



Whole class activity

Or Ps come to BB to fill in table, explaining reasoning.

At speed

Agreement, praising

Ps point out equivalent fractions where relevant.

45 min

Bk4

R: Whole numbers
C: Fractions and decimals. Decimal notation
E: Place value analysis

Lesson Plan 73

Activity | *Notes*

1

Place values

What do the columns in the place-value table mean? T writes the actual values above the letters, as dictated by Ps. (Tth: 10 000, etc.)

Let's write these numbers in the place value table. T does part a), with help of class if possible, as a model for Ps to follow. Ps come to BB to do the rest, explaining reasoning. Class points out errors.

BB:

a) 8076 = (8 × 1000 + 0 × 100 + 7 × 10 + 6 × 1)
b) 3405 = (3 × 1000 + 4 × 100 + 0 × 10 + 5 × 1)
c) 10 007 = (1 × 10 000 + 0 × 1000 + 0 × 100 + 0 × 10 + 7 × 1)
d) 2220 = (2 × 1000 + 2 × 100 + 2 × 10 + 0 × 1)

10 000	1000	100	10	1
TTh	Th	H	T	U
	8	0	7	6
	3	4	0	5
1	0	0	0	7
	2	2	2	0

T points to, e.g. the '7' in 8076. What is its digit value? (7) What is its place value? (7T) What is its real value? (70) Ps choose other digits and give the 3 values. Class agrees/disagrees.

5 min

Notes:

Whole class activity

Drawn on BB or use enlarged copy master or OHP

At a good pace

Reasoning, agreement, praising

Feedback for T

2

Units of length

Elicit the relationship between cm and mm (m and cm). (BB)

Lets write these lengths in the tables. Ps come to BB to write the lengths in the correct columns in the table and then to write them in a different form. Class points out errors.

BB:

1 cm = 10 mm

	cm	mm	
a) 65 cm 2 mm	65	2	= $\boxed{652}$ mm
4 cm 9 mm	4	9	= $\boxed{49}$ mm
503 mm	50	3	= $\boxed{50}$ cm $\boxed{3}$ mm

1 m = 100 cm

	m	cm	
b) 2 m 34 cm	2	34	= $\boxed{234}$ cm
8 m 5 cm	8	5	= $\boxed{805}$ cm
412 cm	4	12	= $\boxed{4}$ m $\boxed{12}$ cm
508 cm	5	8	= $\boxed{5}$ m $\boxed{8}$ cm

10 min

Notes:

Whole class activity

Drawn on BB or use enlarged copy master or OHP

At a good pace

Agreement, praising

[Preparation for :
a) 1 decimal place
b) 2 decimal places]

T (Ps) shows some of the lengths in real life.

Ps think of other lengths to put in each table.

3

Missing items

Let's fill in the missing items. Ps come to BB or dictate to T, explaining reasoning. Class points out errors.

BB:

a) i) $1\text{ mm} = \frac{1}{10}\ \boxed{\text{cm}}$ ii) $3\text{ mm} = \boxed{\frac{3}{10}}\text{ cm}$

iii) $12\text{ mm} = 1\text{ cm }2\text{ mm} = \frac{12}{10}\ \boxed{\text{cm}} = 1\frac{2}{10}\ \boxed{\text{cm}}$

b) i) $1\text{ cm} = \frac{1}{100}\ \boxed{\text{m}}$ ii) $5\text{ cm} = \boxed{\frac{5}{100}}\text{ m}$

iii) $62\text{ cm} = \frac{62}{100}\ \boxed{\text{m}}$

Notes:

Whole class activity

Written on BB or use enlarged copy master or OHP

At a good pace

Agreement, praising

Class says each equation loudly in unison after it has been completed.

Activity | ***Notes***

3

(Continued)

c) i) 1 p = £$\boxed{\frac{1}{100}}$ ii) 8 p = £$\boxed{\frac{8}{100}}$ iii) 36 p = $\boxed{£}\frac{36}{100}$

iv) 145 p = £$\boxed{\frac{145}{100}}$ = £1 45 p = $\boxed{£}\,1\frac{45}{100}$

d) How can we write £8 50 p in another way? (£8.50)

Who can explain what it means? (e.g. There are 8 whole pounds, then the dot separates the pounds from the 50 p.)

How could we write £687 29 p using only £s? (BB)

Let's think about what each digit really means! T starts each equation and Ps complete it, following the pattern.

BB: £687 29 p = 6 × £100 + 8 × £10 + (7 × £1 + 2 × 10 p + 9 × 1 p)

Or we could write it like this:

BB: (£) $6 \times 100 + 8 \times 10 + (7 \times 1 + 2 \times \frac{1}{10} + 9 \times \frac{1}{100})$

Elicit that:

£1 = 100 p

Discussion, agreement

BB: £8 50 p = £8.50

BB: £687 29 p = £687.29

Using £s and pence

Using only £s

16 min

4

Place value tables for quantities

Let's write these amounts in the correct columns in the place-value tables. Ps come to BB to fill in the columns, explaining reasoning. Class agrees/disagrees.

Let's round these amounts to the nearest whole unit. T points and class shouts out in unison (or T chooses Ps at random). T writes on BB.

BB:

a) <u>1 cm is 1 unit</u>

	T 10 cm	U 1 cm	t $\frac{1}{10}$ cm	
15 cm 3 mm	1	5	3	≈ 15 cm
305 mm	3	0	5	≈ 31 cm
etc.				

b) <u>1 m is 1 unit</u>

	H 100 m	T 10 m	U 1 m	t $\frac{1}{10}$ m	h $\frac{1}{100}$ m	
2 m 85 cm			2	8	5	≈ 3 m
106 m 4 cm	1	0	6	0	4	≈ 106 m
238 cm			2	3	8	≈ 2 m
etc.						

c) <u>£1 is 1 unit</u>

	H £100	T £10	U £1	t £ $\frac{1}{10}$	h £ $\frac{1}{100}$	
£216 48 p	2	1	6	4	8	≈ £216
£30 28 p		3	0	2	8	≈ £30
£407 6 p	4	0	7	0	6	≈ £407
5816 p		5	8	1	6	≈ £58
etc.						

Whole class activity

Drawn on BB or use enlarged copy master or OHT

Ps could have own copies on desks too.

(Ps fill in own tables too if they have them.)

Ps suggest 1 or 2 other amounts to add to each table.

T points to some digits in table and asks Ps to express them in another way, e.g.

a) 3 tenths of a cm = 3 mm

b) 5 hundredths of a m = 5 cm

c) 4 tenths of a £ = 40 p

Extension

Ps demonstrate some of the rounded lengths and amounts of money.

T has measuring tools and model money for Ps to use.

22 min

Activity ***Notes***

5

Book 4, page 73, Q.1

Read: *Change the quantities to the units required and write them in the table.*

For each part, first elicit what the Units column means, then what the other columns mean. [e.g. in a), the Units column shows single cm, the Tens column shows groups of 10 cm, etc.]

T could do the first row in each part as a model for Ps to follow. Ps come to BB to fill in the other rows, explaining reasoning. Class agrees/disagrees. Ps complete the table in *Pbs* too.

Solution:

	(Done later – see below) ↓	H 100	T 10	U 1	t $\frac{1}{10}$	h $\frac{1}{100}$	
a)	35 cm 6 mm = 356 mm (= 35.6 cm)		3	5	6		(cm)
	1 m 20 cm 4 mm = 1204 mm (= 120.4 cm)	1	2	0	4		
	3208 mm = 3 m 20 cm 8 mm (= 320.8 cm)	3	2	0	8		
b)	1 m 63 cm = 163 cm (= 1.63 m)			1	6	3	(m)
	28 m 40 cm = 2840 cm (= 28.40 m)		2	8	4	0	
	605 cm = 6 m 5 cm (= 6.05 m)			6	0	5	
c)	£8 70 p = 870 p (= £8.70)			8	7	0	(£)
	£41 5 p = 4105 p (= £41.05)		4	1	0	5	
	£120 15 p = 12 015 p (= £120.15)	1	2	0	1	5	
	3648 p = £36 48 p (= £36.48)		3	6	4	8	

Let's think about what the numbers in the table really mean! T points to 1st row. **W**hat does this number mean? (35 whole cm and 6 tenths of a cm) Who can write it as a mixed number? P comes to BB.

We could also write it as a decimal number. Who knows how to do it? If no P knows, T writes it on BB. (35.6)

We have replaced this **thick** line in the table (T points) with a dot. We call this dot the decimal point. It separates the whole units from the parts of a unit.

Who knows how to read this decimal number? T reads it if no P knows. ('Thirty-five point six') Let's all read it together. (In unison)

T writes another decimal number on BB (e.g. 1.63). Let's all read it together. (one point six three) Who can tell us what it means? What would it be as a mixed number (i.e. a whole number and a fraction)?

Let's write the other quantities in the table as decimal numbers. T points to each in turn and chooses a P to explain what it means, then another to come to the BB to write it as a decimal. Class reads it in unison.

Whole class activity

Table drawn on BB or use enlarged copy master or OHP

Discussion about the table.

Elicit that the thick vertical line separates the whole units from the parts of a unit.

(Or if Ps wish, they could do remaining numbers in each question as individual work, reviewed with whole class)

Reasoning, agreement, (self-correcting), praising

Whole class discussion

BB: Mixed number Decimal number

$$35\frac{6}{10} = \underset{\substack{\uparrow \\ \text{decimal point}}}{35.6}$$

BB: $1.63 = 1 + \frac{6}{10} + \frac{3}{100}$

$= 1\frac{63}{100}$

T helps where necessary, e.g. 'twenty-eight point four zero' 'forty-one point zero five'

28 min

6

Book 4, page 73

Q.2 Read: *Write the sums in the table.*

Let's see if you can do these on your own! Set a time limit.

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

Let's write the numbers as decimal numbers. T points to each number in turn, chooses a P to write it as a decimal on BB, then the class reads it aloud in unison.

Individual work, monitored, helped

Table drawn on BB or use enlarged copy master or OHP

Reasoning, agreement, self-correction, praising

Whole class activity

At a good pace

Praising, encouragement only

Activity

Notes

6

(Continued)

Solution:

a) $5 \times 10 + 3 \times 1 + 2 \times \frac{1}{10}$

b) $3 \times 100 + 4 \times 10 + 7 \times 1 + 5 \times \frac{1}{10}$

c) $6 \times 1 + 8 \times \frac{1}{10} + 4 \times \frac{1}{100}$

d) $9 \times \frac{1}{10} + 2 \times \frac{1}{100}$

e) $6 \times 10 + 0 \times 1 + 3 \times \frac{1}{10}$

H 100	T 10	U 1	t $\frac{1}{10}$	h $\frac{1}{100}$	
	5	3	2		53.2
3	4	7	5		347.5
		6	8	4	6.84
		0	9	2	0.92
	6	0	3		60.3

T helps where necessary. e.g.

c) 6.84 is read as 'six point eight four'

d) 92 hundredths = $\underline{0}$.92

If there are no whole units in a decimal number, we put a zero in the units column and read the decimal as

'zero point nine two'

e) 60.3 is 60 whole units and 3 tenths of a unit and is read as 'sixty point 3'

34 min

7

Book 4, page 73

Q.3 Read: *Write the quantities in different forms in your exercise book.*

Deal with one row at a time. Do part i) on BB with the whole class first (with help of Ps) as a model for Ps to follow. Rest done as individual work.

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

Solution: e.g. (Accept any correct form.)

a) i) $£4.99 = 499\text{ p} = £4\ 99\text{ p} = £4 + £\frac{99}{100} = £4\frac{99}{100}$

ii) $£41.05 = £41\ 5\text{ p} = £41 + £\frac{5}{100} = £41\frac{5}{100}$ $\left(= £\,41\frac{1}{20}\right)$

iii) $£204.50 = £204\ 50\text{ p} = £204 + £\frac{50}{100} = £204\frac{50}{100}$ $\rightarrow$

b) i) $4.3\text{ cm} = 43\text{ mm} = 4\text{ cm }3\text{ mm} = 4\frac{3}{10}\text{ cm}$

ii) $63.5\text{ cm} = 635\text{ mm} = 63\text{ cm }5\text{ mm} = 63\frac{5}{10}\text{ cm}$ $\rightarrow$

iii) $8.24\text{ m} = 824\text{ cm} = 8\text{ m }24\text{ cm} = 8\frac{24}{100}\text{ m}$ $\rightarrow$

iv) $57.06\text{ m} = 5706\text{ cm} = 57\text{ m }6\text{ cm} = 57\frac{6}{100}\text{ m}$

Whole class activity to start, then individual work, monitored, helped

(Or continue as a whole class activity if Ps are unsure)

Written on BB or SB or OHT

Reasoning, agreement, self-correction, praising

If problems, show in a place-value table.

Extra praise if Ps think of the numbers in brackets

$\left(= £204\frac{1}{2}\right)$

$\left(= 63\frac{1}{2}\text{ cm}\right)$

$\left[= \left(8 + \frac{2}{10} + \frac{4}{100}\right)\text{ m}\right]$

Feedback for T

40 min

8

Pb4b, page 73

Q.4 a) Read: *Draw these lines with a ruler in your exercise book and label them.*

Remind Ps how to draw and measure lengths accurately.

Set a time limit. When Ps have drawn the lines, ask them to give the lengths in different forms. T writes on BB.

b) Read: *Measure the length of these line segments and write it in different forms.*

Set a time limit.. Review at BB with whole class. Ps come to BB or dictate to T. Class agrees/disagrees.

Individual work, monitored, (helped) corrected

Agreement, praising

e.g. 87 mm = 8 cm 7 mm = 8.7 cm = 8 and 7 tenths cm

Agreement, self-correction, praising,

i) 43 mm = 4.3 cm, etc.

ii) 118 mm = 11.8 cm, etc.

45 min

Bk4

R: Whole numbers. Calculations

C: Fractions and decimals

E: Measures. Number line

Lesson Plan 74

Activity | *Notes*

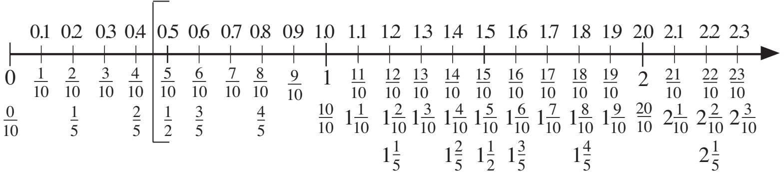
1 Number line

Start with a number line which has only 0 and 1 labelled. What does each 'tick' show? (tenths, because the unit is divided into 10 equal parts)

T labels the first 4 ticks with decimals above the line and fractions below it. Who can label the next tick? Ps comes to BB in pairs, one to say and write the next fraction and the other the next decimal. Class agrees/ disagrees. Ps at BB choose the next pair of Ps.

Discuss simpler equivalent fractions and mixed numbers as appropriate.

BB: T: Ps: (Write only those suggested by Ps.)



8 min

Whole class activity

Drawn on BB or use enlarged copy master or OHP

Remind Ps that, e.g. .1 is always written as 0.1 and is read as 'zero point 1'

Elicit that it means no whole units + 1 tenth of a unit.

At a good pace

Agreement, praising

T (P) points to a fraction or a decimal and class reads it aloud in unison.

Praising, encouragement only

2 Sequences

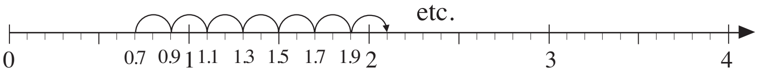
Let's continue the sequences.

a) Its first term is 0.7 and it is increasing by 0.2. Ps dictate the terms and T lists them on the BB. Class points out errors.

BB: 0.7, 0.9, 1.1, 1.3, 1.5, 1.7, 1.9, 2.1, 2.3, 2.5, 2.7, . . .

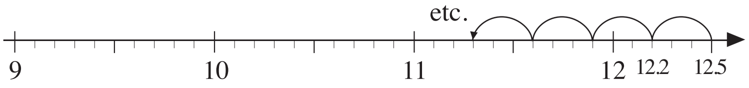
Let's show the sequence as jumps along the number line.
P comes to BB to mark and label the starting number (0.7) and explain its meaning. (No whole units + 7 tenths of a unit)
Other Ps draw the jumps, and label and say the numbers landed on.

BB:



b) Its first term is 12.5 and it is decreasing by 0.3. [As for part a)].

BB: 12.5, 12.2, 11.9, 11.6, 11.3, 11, 10.7, 10.4, 10.1, 9.8, . . .



15 min

Whole class activity

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

Agreement, praising

Or Ps show the jumps at the BB and class shouts out the numbers landed on in unison.

Elicit that:

- 0.0 = 0, 1.0 = 1, 2.0 = 2, 11.0 = 11, etc.
- If a sequence is increasing (decreasing), it is moving to the right (left) along the number line.

3 Place-value table

What do the letters in the table really mean? T writes the values dictated by Ps below the letters in the column headings. What does the thick line mean? (It separates the whole units from the parts of a unit.)

Let's write the numbers in the table in a different way. T starts and Ps come to BB to continue the pattern, explaining reasoning.

BB: Class agrees/disagrees.

H 100	T 10	U 1	t $\frac{1}{10}$	h $\frac{1}{100}$
2	0	8		
	2	0	8	
		2	0	8
	5	4	3	6
		7	9	0

$2 \times 100 + 0 \times 10 + 8 \times 1 = \underline{208}$

$2 \times 10 + 0 \times 1 + 8 \times \frac{1}{10} = 20\frac{8}{10} = \underline{20.8}$

$2 \times 1 + 0 \times \frac{1}{10} + 8 \times \frac{1}{100} = 2 + \frac{8}{100} = 2\frac{8}{100} = \underline{2.08}$

$5 \times 10 + 4 \times 1 + 3 \times \frac{1}{10} + 6 \times \frac{1}{100} = 54 + \frac{3}{10} + \frac{6}{100} = 54 + \frac{36}{100} = \underline{54.36}$

$7 \times 1 + 9 \times \frac{1}{10} + 0 \times \frac{1}{100} = 7 + \frac{9}{10} = 7\frac{9}{10} = \underline{7.9}$

Extension Ps could think of their own numbers to add to the table.

20 min

Whole class activity

Table drawn on BB or use enlarged copy master or OHP

At a good pace

Reasoning, agreement, praising

Point out that:

7.90 = 7.9

2.08 is read as 'two point zero eight'

T points to a number in the table and chooses Ps to read it as a mixed number or as a decimal.

Bk4

Lesson Plan 74

Activity

Notes

4

Fractions and decimals

Let's write these fractions as a decimal. Ps come to BB to write the decimals, explaining reasoning. Class agrees/disagrees.

Elicit simpler equivalent fractions and mixed numbers where relevant.

BB:

$\frac{1}{10} = (0.1)$ $\left(\frac{1}{5} =\right) \frac{2}{10} = (0.2)$ $\frac{3}{10} = (0.3)$ $\left(\frac{2}{5} =\right) \frac{4}{10} = 0.4$

$\left(\frac{1}{2} =\right) \frac{5}{10} = (0.5)$ $\left(\frac{3}{5} =\right) \frac{6}{10} = (0.6)$ $\frac{7}{10} = (0.7)$

$\left(\frac{4}{5} =\right) \frac{8}{10} = (0.8)$ $\frac{9}{10} = (0.9)$ $\frac{10}{10} = (1 = 1.0)$

$\left(1\frac{1}{10} =\right) \frac{11}{10} = (1.1)$ $\left(1\frac{2}{5} =\right) 1\frac{4}{10} = (1.4)$ $3\frac{9}{10} = (3.9)$

$\left(15\frac{1}{5} =\right) 15\frac{2}{10} = (15.2)$, etc.

Whole class activity

Written on BB or SB or OHT

Reasoning, agreement, praising

Extra praise if Ps notice bracketed forms without hints or help.

Feedback for T

Ps suggest 1 or 2 other fractions or mixed numbers if there is time.

25 min

5

Book 4, page 74

Q.1 Read: *Join up the decimal numbers to the matching points on the number line. Continue the pattern.*

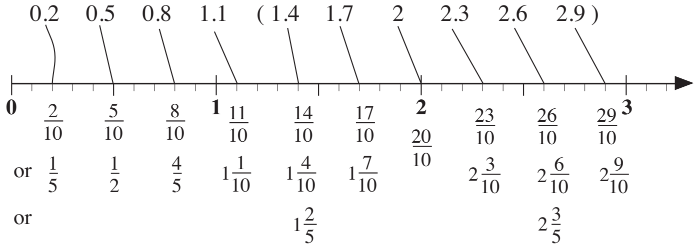
Make sure that Ps understand the task. Elicit the rule for the sequence of decimals. (*Rule:* + 0.3) Set a time limit.

Review with whole class. Ps come to BB to write the decimals and draw joining lines (or T has solution already prepared and uncovers each decimal as it is dealt with). Mistakes discussed and corrected.

Read: *Write the decimal numbers as fractions below the line.*

T points to each decimal in turn and Ps dictate the fractions. Class points out simpler equivalent fractions or mixed numbers where appropriate.

Solution:



Individual work, monitored, helped

Drawn on BB or use enlarged copy master or OHP

Discussion, reasoning, agreement, self-correction, praising

Whole class activity (or individual work if Ps wish)

Accept any correct form of fraction.

Agreement, praising

Extra praise if Ps point out other forms without help

Feedback for T

30 min

6

Book 4, page 74, Q.2

Read: *Find equivalent fractions in the diagram. Write them as decimals too.*

Ps dictate equivalent fractions or come to BB to show them on the diagram. Class agrees/disagrees. T writes them in a systematic way on the BB.

BB: $\frac{2}{10} = \frac{1}{5} = 0.2$, $\frac{4}{10} = \frac{2}{5} = 0.4$, $\frac{5}{10} = \frac{1}{2} = 0.5$,

$\frac{6}{10} = \frac{3}{5} = 0.6$, $\frac{8}{10} = \frac{4}{5} = 0.8$, $\frac{10}{10} = \frac{5}{5} = \frac{2}{2} = 1 = 1.0$

Whole class activity (or individual work if Ps wish)

Drawn on BB or use enlarged copy master or OHP

Reasoning, agreement, praising

Also elicit that

$\frac{1}{10} = 0.1$, $\frac{3}{10} = 0.3$, etc.

35 min

Bk4

Lesson Plan 74

Activity

Notes

7

Book 4, page 74

Q.2 Read: *Complete the table and the equations. Follow the pattern.*

If some Ps are unsure, ask a P who understands to explain the task using the row already completed.

Set a time limit. Ps finished quickly can be given an extra number to deal with. (e.g. 98.30)

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

Solution: (Items inside boxes were missing.)

H 100	T 10	U 1	t $\frac{1}{10}$	h $\frac{1}{100}$	
	2	5	1	8	$2 \times 10 + 5 \times 1 + 1 \times \frac{1}{10} + 8 \times \frac{1}{100} = 25 + \frac{18}{100} = 25.18$
1	0	4	3		$\boxed{1 \times 100 + 0 \times 10 + 4 \times 1 + 3 \times \frac{1}{10} = 104 + \frac{3}{10} = 104.3}$
		6	5	7	$\boxed{6 \times 1 + 5 \times \frac{1}{10} + 7 \times \frac{1}{100} = 6 + \frac{57}{100} = 6.57}$
8	**0**	**3**	**4**		$8 \times 100 + 0 \times 10 + 3 \times 1 + 4 \times \frac{1}{10} = \boxed{803 + \frac{4}{10} = 803.4}$
	2	**6**	**7**		$\boxed{2 \times 10 + 6 \times 1 + 7 \times \frac{1}{10}} = 26 + \frac{7}{10} = \boxed{26.7}$
	1	**0**	**0**	**5**	$\boxed{1 \times 10 + 0 \times 1 + 0 \times \frac{1}{10} + 5 \times \frac{1}{100} = 10 + \frac{5}{100}} = 10.05$
	9	8	3	0	$9 \times 10 + 8 \times 1 + 3 \times \frac{1}{10} + 0 \times \frac{1}{100} = 98 + \frac{30}{100} = 98.30$

or $= 98\frac{3}{10} = 98.3$

Individual work, monitored, helped

Drawn on BB or use enlarged copy master or OHP

Differentiaton by time limit

Reasoning, agreement, self-correction, praising

Agree that 98.30 = 98.3

T covers up (or rubs out) the details on the BB, points to a number in the table and chooses Ps to read it as a decimal and as a mixed number.

40 min

8

Book 4, page 74

Q.4 Read: *Convert the quantities. Follow the pattern. Fill in the missing numbers.*

What does convert mean? (Change to a different unit.)
If Ps are unsure what to do, T (or P who understands) explains at BB using the completed rows. Set a time limit.

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

Solution:

a) $5 \text{ cm } 8 \text{ mm} = 5\frac{8}{10} \text{ cm} = 5.8 \text{ cm}$ (= 58 mm)

$36 \text{ cm } 5 \text{ mm} = (36\frac{5}{10} \text{ cm} = 36.5 \text{ cm})$ (= 365 mm)

b) $8 \text{ m } 63 \text{ cm} = 863 \text{ cm} = 8\frac{63}{100} \text{ m} = 8.63 \text{ m}$

$1 \text{ m } 24 \text{ cm} = (124 \text{ cm} = 1\frac{24}{100} \text{ m} = 1.24 \text{ m})$

$25 \text{ m } 70 \text{ cm} = (2570 \text{ cm} = 25\frac{70}{100} \text{ m} = 25.70 \text{ m} = 25.7 \text{ m})$

Individual work, monitored, helped

Written on BB or SB or OHT

BB: 1 cm = 10 mm
1 m = 100 cm

Differentiation by time limit

Discussion, reasoning, agreement, self-correction, praising

Extensions

1. Round the quantities to the nearest whole cm or m as appropriate.
2. T says an amount of money in £s and pence. Ps convert the amount to £s, giving a mixed number or a decimal.

e.g. £4 85 p (= £4 and 85 hundredths = £4.85)
£10 5 p (= £10 and 5 hundredths = £10.05)
£10 50 p (= £10 and 50 hundredths = £10.50 = £10.5

Whole class activity, done orally round class

e.g. 5.8 cm ≈ 6 cm
1.24 m ≈ 1 m

(= £$10\frac{1}{2}$)

45 min

Bk4

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

Lesson Plan 75

Activity		*Notes*

1

Ordering numbers

Let's put these numbers in increasing order. Ps come to BB to write the numbers again, crossing out each one from the original list as it is dealt with (or to rearrange the cards). Class points out errors.

BB:

a) 2, 4301, 529, 0, 38, 3946, 79

Ps: $0 < 2 < 38 < 79 < 529 < 3946 < 4301$

b) $\frac{5}{20}, \frac{17}{20}, \frac{30}{20}, \frac{1}{20}, \frac{9}{20}, \frac{0}{20}, \frac{21}{20}$

Ps: $\frac{0}{20} < \frac{1}{20} < \frac{5}{20} < \frac{9}{20} < \frac{17}{20} < \frac{21}{20} < \frac{30}{20}$

$0 \qquad \frac{1}{4} \qquad 1\frac{1}{20} \qquad \frac{3}{2} = 1\frac{1}{2}$

c) 0.7, 2.1, 5.0, 0.01, 0.25, 5, 2, 3, 0.1

Ps: $0.01 < 0.1 < 0.25 < 0.7 < 2 < 2.1 < 3 < 5 = 0.5$

8 min

Whole class activity

Numbers written on BB or on number cards stuck to BB.

At a good pace

Agreement, praising

If problems, show on the relevant segment of the number line drawn on BB.

In b) Ps give equivalent fractions where relevant and point out which fractions are less than (more than) 1.

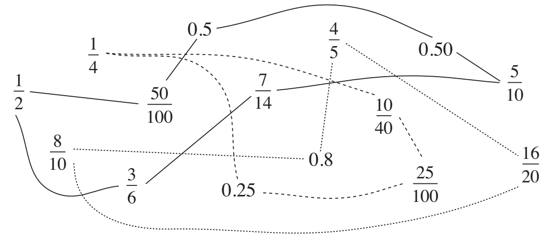
In c), elicit that, e.g. 2 = 2.0, 0.01 = 1 hundredth, etc.

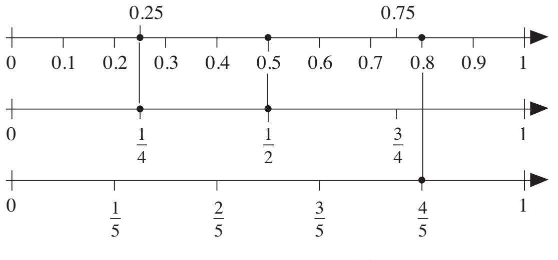
2

Equal numbers

Let's join the equal numbers in a chain. Ps come to BB to draw joining lines, explaining reasoning. Agree that if the numerator and denominator of a fraction are divided (multiplied) by the same number, the value of the fraction remains the same.

BB:





etc.

14 min

Whole class activity

Written on BB (or on number cards stuck to BB) or use enlarged copy master or OHP

Use a different colour for each chain. At a good pace

Reasoning, agreement, praising

Show the equal numbers on a prepared number line (as opposite) or use other models.

Ps think of true statements about the numbers, e.g.

$0.20 < 0.25 < 0.30$,

$0.2 < 0.25 < 0.3$

$\frac{1}{4}$ is half of $\frac{1}{2}$

0.25 is half of 0.50, etc.)

3

Comparison

Which is more? How much more? How can we show it? How can we write it? Ps suggest different ways (might include drawing a diagram).

a) $\frac{3}{10}$ and 0.4 e.g. $\frac{3}{10} \underset{\frac{1}{10}}{<} \frac{4}{10}$ or $0.3 \underset{0.1}{<} 0.4$ so $\frac{3}{10} < 0.4$

b) $\frac{27}{100}$ and 0.31 e.g. $\frac{27}{100} \underset{\frac{4}{100}}{<} \frac{31}{100}$ or $0.27 \underset{0.04}{<} 0.31$ so $\frac{27}{100} < 0.31$

c) $\frac{1}{2}$ and $\frac{2}{5}$ e.g. $\frac{5}{10} \underset{\frac{1}{10}}{>} \frac{4}{10}$ so $\frac{1}{2} > \frac{2}{5}$ etc.

20 min

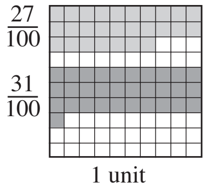
Whole class activity

Written on BB or SB or OHT

T gives hints if Ps are stuck.

Discussion, reasoning, agreement, praising

BB: e.g.
b)



Activity

Notes

4

Problem

Listen carefully, write the data in your *Ex. Bks*. and think how you would solve it.

Bob Bunny ate 2 fifths of 2 kg of carrots and Sue Bunny ate 0.8 of 1 kg of carrots. Who ate more carrots? How much more?

A, how would you solve it. Who agrees? Who would do it another way? etc. Draw a diagram if Ps do not suggest it.

BB: e.g.

Bob: $\frac{2}{5}$ of 2 kg = 2000 g ÷ 5 × 2 = 400 g × 2 = $\underline{800 \text{ g}}$

Sue: 0.8 of 1 kg = $\frac{8}{10}$ of 1000 g = 1000 g ÷ 10 × 8

= 100 g × 8 = $\underline{800 \text{ g}}$

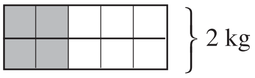
Answer: They both ate 800 g of carrots.

Whole class activity

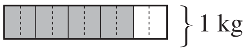
T repeats slowly to give Ps time to think.

Reasoning, agreement, praising

BB: e.g.



$\frac{2}{5}$ of 2 kg = $\frac{4}{10}$ of 2 kg



0.8 of 1 kg = $\frac{8}{10}$ of 1 kg

24 min

5

Book 4, page 75

Q.1 Read: *Fill in the missing numbers and write the quantities in the place-value table using the units given.*

Who can explain what the thick vertical line in the table means? (It separates the whole units from the parts of a unit.) What other symbol does the same thing? (The decimal point in a decimal number) Set a time limit.

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

Solution:

		H 100	T 10	U 1	t $\frac{1}{10}$	h $\frac{1}{100}$	
a)	15 m + $\frac{1}{10}$ m + $\frac{8}{100}$ m = $\boxed{15}$ m $\boxed{18}$ cm		1	5	1	8	(m)
b)	300.45 m = $\boxed{300}$ m $\boxed{45}$ cm	3	0	0	4	5	(m)
c)	$7\frac{8}{100}$ litres = $\boxed{7}$ litres $\boxed{8}$ cl			7	0	8	(ℓ)
d)	£106.80 = £ $\boxed{106}$ $\boxed{80}$ p	1	0	6	8	0	(£)
e)	28.5 kg = $\boxed{28}$ kg $\boxed{500}$ g		2	8	5		(kg)

Individual work, monitored, helped

Written on BB or use enlarged copy master or OHP

Differentiation by time limit

Reasoning, agreement, self-correction, praising

Revise relationship between the units of measure if necessary.

BB: 1 m = 100 cm
1 litre = 100 cl
£1 = 100 p
1 kg = 1000 g

T points to a number in the table and Ps read it as a decimal or a mixed number.

29 min

6

Book 4, page 75

Q.2 Read: *Write the numbers in increasing order in your exercise book.*

Set a time limit. Deal with one part at a time if the class is not very able (or do part c) with the whole class).

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

Show on the relevant segment of the number line if problems.

Solution:

a) $3 < 71 < 452 < 460 < 683 < 2009 < 2015 < 9999$

b) $\frac{1}{15} < \frac{3}{15} < \frac{4}{15} < \frac{11}{15} < \frac{14}{15} < \frac{16}{15} < \frac{20}{15} < \frac{30}{15}$

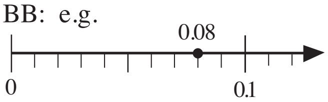
c) $0.08 < 0.3 < 0.32 < 0.4 < 3.1 < 6.9 < 7.0$ $(= 7)$

Individual work monitored, helped

Written on BB or SB or OHT

Reasoning, agreement, self-correction, praising

BB: e.g.



Ps suggest what else could be done with the numbers, e.g.

a) rounding (to 10, 100, 1000)

b) give equivalent fractions and mixed numbers

c) give as fractions

34 min

Activity ***Notes***

7

Book 4, page 75

Q.3 Read: *Compare the pairs of numbers and fill in the missing signs. Use the diagrams to help you.*

What have the diagrams to do with the fractions? Elicit that:

- the strip shows 1 unit divided into tenths,
- the 10 × 10 square shows 1 unit divided into hundredths.

Set a time limit. Review at BB with whole class. Ps come to BB or dictate inequality to T. Class agrees/disagrees. Mistakes discussed and corrected. Convert fractions to decimals or *vice versa* as a check. Show on relevant diagrams if problems.

Solution:

a) $\frac{2}{10} < \frac{7}{10}$, $\frac{8}{10} < 0.9$, $0.6 > 0.3$

b) $\frac{15}{100} < \frac{72}{100}$, $\frac{43}{100} < 0.70$, $0.52 > 0.49$

c) $0.04 < 0.1$, $\frac{2}{10} > \frac{18}{100}$, $0.27 < 0.3$

d) $\frac{1}{5} = 0.2$, $\frac{2}{5} > 0.3$, $\frac{3}{10} < 0.6$

e) $\frac{1}{5} > \frac{17}{100}$, $\frac{3}{10} < 0.51$, $\frac{78}{100} > 0.53$

39 min

Individual work monitored, helped

[or parts d) and e) done with the whole class]

Written on BB or use enlarged copy master or OHP

Differentiation by time limit

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

BB: e.g.

a) $0.9 = \frac{9}{10}$

b) $\frac{43}{100} = 0.43$

c) $\frac{4}{100} < \frac{10}{100}$, $\frac{2}{10} = \frac{20}{100}$

d) $\frac{1}{5} = \frac{2}{10} = 0.2$

e) $\frac{1}{5} = \frac{20}{100}$, $\frac{78}{100} = 0.78$,

etc.

8

Book 4, page 75, Q.4

Read: *Calculate the quantities and compare each pair.*
Write <. > or = in the boxes.

Ps come to BB to work out LHS and RHS of inequality, explaining reasoning. Class agrees/disagrees or suggests an easier way of calculating.

e.g. in c): $0.5 = \frac{5}{10} = \frac{1}{2}$; in d): $0.25 = \frac{25}{100} = \frac{5}{20} = \frac{1}{4}$

Which is more? How much more? Ps come to BB to write missing signs and differences. T helps where necessary.

Solution: e.g.

a) $\frac{1}{5}$ of 450 m = 450 m ÷ 5 = $\underline{90 \text{ m}}$ $\boxed{<}$ 190 m 0.28 of 1 km = 1000 m ÷ 100 × 28 = 10 m × 28 = $\underline{280 \text{ m}}$

b) 0.6 of 150 litres = 150 litres ÷ 10 × 6 = 15 litres × 6 = $\underline{90 \text{ litres}}$ $\boxed{>}$ 20 litres $\frac{7}{10}$ of 100 litres = 100 litres ÷ 10 × 7 = 10 litres × 7 = $\underline{70 \text{ litres}}$

c) $\frac{1}{4}$ of 28 kg = 28 kg ÷ 4 = $\underline{7 \text{ kg}}$ $\boxed{=}$ 0.5 of 14 kg = 14 kg ÷ 2 = $\underline{7 \text{ kg}}$

d) 0.25 of £220 = £220 ÷ 4 = $\underline{£55}$ or £220 ÷ 100 × 25 = 220 p × 25 = 5500 p = $\underline{£55}$ $\boxed{<}$ £12.50 $\frac{3}{4}$ of £90 = £90 ÷ 4 × 3 = £22.50 × 3 = £66 + £1.50 = $\underline{£67.50}$

45 min

Whole class activity

(or a) and b) individually if Ps wish)

Written on BBor use enlarged copy master or OHP

Discussion, reasoning, agreement, (self-correcting), praising, encouragement only

Extra praise if Ps think of easier ways to calculate, as shown in solution and below.

e.g.

d) 220 × 25 = 110 × 50 = 1100 × 5 = $\underline{5500}$ (p)

£90 ÷ 4 = £90 ÷ 2 ÷ 2
= £45 ÷ 2
= £22 and a half
= $\underline{£22.50}$

Feedback for T

Bk4

R: Calculations

C: Fractions and decimals

E: Quantities. Word problems

Lesson Plan
76

Activity | *Notes*

1

Fractions and decimals

Let's convert (change) the fractions to decimals and the decimals to fractions. Ps come to BB or dictate what T should write. Class agrees/disagrees. Use a model if necessary (e.g. diagram on BB or coloured multilink cubes)

BB:

a) $\frac{1}{2} = (0.5),\ \frac{2}{2} = (1),\ \frac{3}{2} = (1.5),\ \frac{4}{2} = (2),\ \frac{5}{2} = (2.5)$, etc.

b) $\frac{1}{4} = (0.25),\ \frac{2}{4} = (0.5),\ \frac{3}{4} = (0.75),\ \frac{4}{4} = (1),$

$\frac{5}{4} = (1.25),\ \frac{6}{4} = (1.5),\ \frac{7}{4} = (1.75),\ \frac{8}{4} = (2)$, etc.

c) $\frac{1}{5} = (0.2),\ \frac{2}{5} = (0.4),\ \frac{3}{5} = (0.6),\ \frac{4}{5} = (0.8),\ \frac{5}{5} = (1),$

$\frac{6}{5} = (1.2),\ \frac{7}{5} = (1.4),\ \frac{8}{5} = (1.6),\ \frac{9}{5} = (1.8),\ \frac{10}{5} = (2)$, etc.

d) $0.3 = \left(\frac{3}{10}\right),\ 0.4 = \left(\frac{4}{10} = \frac{2}{5}\right),\ 0.5 = \left(\frac{5}{10} = \frac{1}{2}\right),$

$0.6 = \left(\frac{6}{10} = \frac{3}{5}\right),\ 1.1 = \left(\frac{11}{10} = 1\frac{1}{10}\right),\ 4.5 = \left(\frac{45}{10} = 4\frac{5}{10} = 4\frac{1}{2}\right)$

e) $0.10 = \left(\frac{10}{100} = \frac{1}{10}\right),\ 0.60 = \left(\frac{60}{100} = \frac{6}{10} = \frac{3}{5}\right),\ 0.31 = \left(\frac{31}{100}\right)$

$2.40 = \left(2\frac{40}{100} = 2\frac{4}{10} = 2\frac{2}{5}\right),\ 0.25 = \left(\frac{25}{100} = \frac{5}{20} = \frac{1}{4}\right)$

10 min

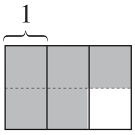
Whole class activity

Written on BB or SB (built up gradually)

Agreement, praising

BB: e.g.

$\frac{5}{2} = 2.5$



Note the connections, e.g.

BB: $\frac{1}{2} = \frac{2}{4} = \frac{5}{10} = 0.5$

$\frac{1}{4}$ = 100 hundredths ÷ 4

= 25 hundredths = $\underline{0.25}$

$\frac{3}{4} = \frac{1}{4} \times 3 = 0.25 \times 3$

$= \underline{0.75}$

(or = 25 hundredths × 3

= 75 hundredths = $\underline{0.75}$)

Feedback for T

2

Quantities

Let's convert these quantities to other units of measure. Ps come to BB or dictate to T. Class agrees/disagrees.

BB: e.g.

a) $\frac{1}{2}$ of a km = <u>500 m</u> $\frac{1}{3}$ of an hour = <u>20 minutes</u>

$\frac{1}{5}$ of a litre = <u>20 cl</u> $\frac{1}{10}$ of a kg = <u>100 g</u>

b) 0.5 of a metre = <u>50 cm</u> (= <u>500 mm)</u> 0.25 of a kg = <u>250 g</u>

0.2 of a litre = <u>20 cl</u> (= <u>200 ml)</u>

c) $\frac{3}{4}$ of a m = <u>75 cm</u> (= <u>750 mm</u>) $\frac{1}{5}$ of an hour = <u>12 minutes</u>

$\frac{1}{10}$ of an hour = <u>6 minutes</u> $1\frac{1}{4}$ hours = (60 + 15) minutes

= <u>75 minutes</u>

d) 0.2 of an hour = <u>12 minutes</u> 1.37 m = <u>137 cm</u> (= <u>1370 mm</u>)

4.7 kg = <u>4700 g</u> 3.5 hours = (180 + 30) minutes

= <u>210 minutes</u>

16 min

Whole class activity

Written on BB or SB or OHT

At a good pace

Reasoning, agreement, praising

Reasoning: e.g.

$\frac{1}{3}$ of an hour = $\frac{1}{3}$ of 60 min

= 60 min ÷ 3 = <u>20 min.</u>

$\frac{3}{4}$ of a m = $\frac{3}{4}$ of 100 cm

= 100 cm ÷ 4 × 3

= 25 cm × 3 = <u>75 cm</u>

etc.

Activity

3

Problems

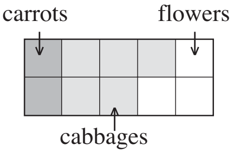
Listen carefully, note down the data and think how you would solve it.

T reads the problem 2 or 3 times to give Ps time to think. Ps come to BB to show solution, explaining reasoning. Class agrees/disagrees or suggests another way to solve it. Class says answer as a sentence.

a) *One fifth of a garden was planted with carrots and 0.5 of the garden was planted with cabbages. The rest of the garden was used for growing flowers.*

What part of the garden was used for growing flowers?

BB: e.g.



Part used for vegetables:

$$\frac{1}{5} + 0.5 = \frac{2}{10} + \frac{5}{10} = \frac{7}{10}$$

Part used for flowers: $\frac{10}{10} - \frac{7}{10} = \frac{3}{10}$ (= 0.3)

Answer: Three tenths (or 0.3) of the garden was used for flowers.

b) *John took 2 hours to do his homework. He spent 1 quarter of the time on English. How long did he spend on English and how long did he spend on other subjcts?*

BB: e.g.

Homework: 2 hours = 2 × 60 min = 120 minutes

English: $\frac{1}{4}$ of 120 minutes = 120 min ÷ 4 = <u>30 min</u>

Other subjects: 120 min – 30 min = 90 min =<u>1 hr 30 min</u>

Answer: John spent half an hour on English and one and a half hours on other subjects.

c) *Graham used 35 cm of wire to make a model plane. This was 0.7 of the length of wire he had to start with.*

How much wire did he have before he made the model?

BB: e.g. $0.7 \left(= \frac{7}{10}\right) \rightarrow$ 35 cm

$0.1 \left(= \frac{1}{10}\right) \rightarrow$ 35 cm ÷ 7 = 5 cm

$1 \left(= \frac{10}{10}\right) \rightarrow$ 35 cm ÷ 7 × 10 = <u>50 cm</u>

Answer: Graham had 50 cm of wire before he made the model.

24 min

Notes

Whole class activity

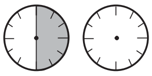
(Or individual trial first if Ps wish)

Ps decide how to begin and what to do next. T helps or gives hints only if ncessary.

Discussion, reasoning, agreement, (self-correction), praising

Or $1 - \left(\frac{2}{10} + \frac{5}{10}\right) = \frac{3}{10}$

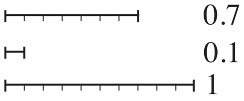
BB:



(30 min = $\frac{1}{2}$ hr)

(1 hr 30 min = $1\frac{1}{2}$ hours)

BB:



Extension

How much wire was left?

0.3 → 5 cm × 3 = <u>15 cm</u>

or 50 cm – 35 cm = <u>15 cm</u>

Bk4

Lesson Plan 76

Activity

Notes

4

Book 4, page 76

Q.1 Read: *Convert the fractions to decimals and the decimals to fractions.*

Deal with one row at a time. Set a time limit.
Review at BB with whole class. Ps come to BB or dictate to T, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected.

Solution:

a) $\frac{1}{2} = \underline{0.5}$ $\frac{2}{2} = \underline{1}$ $\frac{5}{2} = \underline{2.5}$ $6\frac{1}{2} = \underline{6.5}$

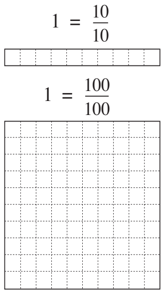
b) $0.1 = \underline{\frac{1}{10}}$ $0.2 = \frac{2}{10} = \underline{\frac{1}{5}}$ $0.5 = \frac{5}{10} = \underline{\frac{1}{2}}$ $0.9 = \underline{\frac{9}{10}}$

c) $\frac{1}{4} = \underline{0.25}$ $\frac{3}{4} = \underline{0.75}$ $2\frac{1}{4} = \underline{2.25}$ $\frac{19}{4} = \underline{4.75}$

d) $0.17 = \underline{\frac{17}{100}}$ $0.30 = \frac{30}{100} = \underline{\frac{3}{10}}$ $2.1 = \underline{2\frac{1}{10}}$ $6.5 = \underline{6\frac{1}{2}}$

e) $1.2 = 1\frac{2}{10} = \underline{1\frac{1}{5}}$ $3.80 = 3\frac{80}{100} = 3\frac{8}{10} = \underline{3\frac{4}{5}}$

$12.05 = 12\frac{5}{100} = \underline{12\frac{1}{20}}$ $0.75 = \frac{75}{100} = \underline{\frac{3}{4}}$



30 min

Individual work, monitored, helped

(or more difficult items done with the whole class)

Written on BB or use enlarged copy master or OHT

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

Details: e.g.

$$\frac{19}{4} = 4\frac{3}{4} = \underline{4.75}$$

Refer to the 10-strip or 100-square if disagreement.

Accept any correct form of fraction but elicit the simplest form where relevant.

5

Book 4, page 76

Q.2 Read: *Fill in the missing numbers.*

Quickly revise the relationship between the units of measure. Calculations can be done in *Ex. Bks* if necessary. Set a time limit.

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

Solution:

a) i) $\frac{1}{2}$ litre = $\underline{500 \text{ ml}}$ ii) $\frac{1}{4}$ m = $\underline{25}$ cm = $\underline{250}$ mm

iii) $\frac{1}{5}$ kg = $\underline{200}$ g iv) $\frac{1}{10}$ km = $\underline{100}$ m

b) i) $\frac{3}{4}$ m = $\underline{75}$ cm = $\underline{750}$ mm ii) $\frac{2}{5}$ litre = $\underline{400}$ ml

iii) $2\frac{1}{2}$ km = $\underline{2500}$ m iv) $\frac{3}{10}$ hour = $\underline{18}$ minutes

c) i) 0.1 km = $\underline{100}$ m ii) 0.2 litre = $\underline{200}$ ml

iii) 0.3 m = $\underline{30}$ cm = $\underline{300}$ mm iv) 0.7 kg = $\underline{700}$ g

d) i) 1.3 kg = $\underline{1300}$ g ii) 2.5 km = $\underline{2500}$ m

iii) 5.6 m = $\underline{560}$ cm = $\underline{5600}$ mm iv) 6.25 litres = $\underline{6250}$ ml

36 min

Individual work, monitored, helped

Written on BB or use enlarged copy master or OHP

Differentitain by time limit

Reasoning, agreement, self-correction, praising

Show details of calculations on BB if problems, e.g.

$\frac{3}{10}$ hour = $\frac{3}{10}$ of 60 min.

= 60 min. ÷ 10 × 3

= 6 min. × 3 = $\underline{18 \text{ min}}$.

etc.

Feedback for T

Activity

Notes

6

Book 4, page 76

Q.3 Read: *Solve the problems in your exercise book.*

Ps read problem themselves, underline the data, write a plan, do the calculation, check it and write the answer as a sentence.

Deal with one problem at a time. Set a time limit.

Individual work, monitored, helped

Review with whole class. Ps could show results on scrap paper or slates on command. Ps answering correctly come to BB to explain to Ps who were wrong. Who did the same? Who did it a different way? etc. Mistakes discussed and corrected.

Discussion, reasoning, agreement, self-correcting, praising

Solutions: e.g.

Accept any correct method of solution but ask Ps to show any other methods used.

a) *A group of friends went on a 3-day trip. They covered 4 tenths of the journey on the first day and 0.3 of the journey on the second day.*

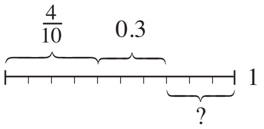
How much of the journey would they have to do on the 3rd day?

BB: 1st day: $\frac{4}{10}$ 2nd day: $0.3 = \frac{3}{10}$

3rd day: $1 - \left(\frac{4}{10} + \frac{3}{10}\right) = 1 - \frac{7}{10} = \frac{3}{10}$ (= 0.3)

Answer: They would have to do 3 tenths (or 0.3) of the journey on the 3rd day.

BB: e.g.



b) *Lucy spent 1 and a half hours on her homework. She spent 0.4 of the time on mathematics.*

How long did she spend on mathematics? How long did she spend on other subjects?

BB: Homework: $1\frac{1}{2}$ hours = (60 + 30) min = 90 min.

Maths: 0.4 of 90 minutes $= \frac{4}{10}$ of 90 min.

= 90 min ÷ 10 × 4

= 9 min × 4

= <u>36 min</u>

Other subjects: 90 min – 36 min =<u>54 min</u>

Or other subjects: $0.6 = \frac{6}{10}$

$\frac{6}{10}$ of 90 min = 9 min × 6

= <u>54 min.</u>

Answer: Lucy spent 36 minutes on mathematics and 54 minutes on other subjects.

c) *Sam spent £72, which was 0.6 of his savings, on Christmas presents. How much had Sam saved? How much did he have left?*

BB: Spent: $0.6 \left(= \frac{6}{10}\right) \rightarrow$ £72

$0.1 \left(= \frac{1}{10}\right) \rightarrow$ £72 ÷ 6 = £12

Had: $1 \left(= \frac{10}{10}\right) \rightarrow$ £72 ÷ 6 × 10 = <u>£120</u>

Had left: 0.4

0.4 → £12 × 4 = <u>£48</u>

or Had left: £120 – £72

= <u>£48</u>

Answer: Sam had saved £120 but now had £48 left.

45 min

Bk4

R: Calculations

C: Addition/subtraction of decimals (1 decimal place)

E: 2 decimal places

Lesson Plan 77

Activity

Notes

1

Modelling decimals

a) This rectangle is 1 unit. Who can show us 1 tenth of its area?

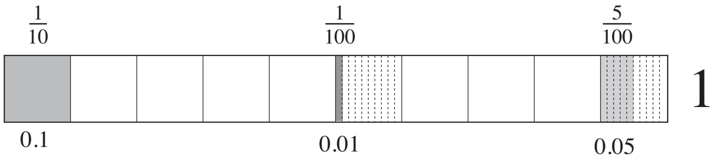
P comes to BB to show it. Class agrees/disagrees. How could we write it as a decimal?

BB: $\frac{1}{10} = 0.1$

b) Who can show us 1 tenth of 1 tenth of the area? P comes to BB to show it (with T's help). What fraction of 1 unit is it? (1 hundredth) Who could write a statement about it using fractions (decimals)?

c) Who can show us 5 hundredths of the area? P comes to BB to colour it. How could we write it as a decimal?

BB:



5 min

Whole class activity

Drawn on BB or SB or OHT

(T could have 'ticks' along top and bottom to help Ps divide it up equally.)

Agreement, praising

BB: $\frac{1}{10}$ of $\frac{1}{10} = \frac{1}{100}$

$0.1 \text{ of } 0.1 = 0.01$

BB: $\frac{5}{100} = 0.05$

2

Missing numbers

a) Let's fill in the missing numbers. Ps come to BB to write as decimals or fractions, explaining reasoning. Class agrees or disagrees. Also elicit from the class the form not given.

BB:

1 mm = $\boxed{0.1}$ cm $\left(\frac{1}{10}\right)$ 1 cm = $\boxed{0.01}$ m $\left(\frac{1}{100}\right)$ 1 mm = $\boxed{0.001}$ m $\left(\frac{1}{1000}\right)$

1 m = $\boxed{0.001}$ km $\left(\frac{1}{1000}\right)$ 1 cl = $\boxed{0.01}$ litre $\left(\frac{1}{100}\right)$ 1 g = $\boxed{0.001}$ kg $\left(\frac{1}{1000}\right)$

b) We measured the length of a line segment as 76 mm, using 1 mm as 1 unit. Who could write its length using these units?

i) 1 cm as 1 unit: BB: 76 mm = $\boxed{7\frac{6}{10}}$ cm = $\boxed{7.6}$ cm

ii) 1 m as 1 unit: BB: 76 mm = $\boxed{0.076}$ m = $\boxed{\frac{76}{1000}}$ cm

10 min

Whole class activity

Written on BB or SB or OHT

Reasoning (with T's help), agreement, praising

Reasoning, eg

'1 mm is $\frac{1}{1000}$ of a metre because 1 m = 1000 mm.' etc.

Extra praise if Ps cope with thousandths without help from T

Have no expectations!

Feedback for T

3

Problem 1

Listen carefully, note down the important data and think how you would solve the problem.

Nick decided to dig a trench at the bottom of his garden in preparation for planting a hedge.

On the first day, he dug 2 m 70 cm, on the second day he dug 3.8 metres, on the third day he dug 4 metres and on the fourth day he dug 3 and 6 tenths metres. How long was the trench altogether?

Ps suggest methods of solution. T helps with layout and reasoning and shows the methods Ps did not think of.

Whole class activity

T reads slowly 2 or 3 times to give Ps time to think.

T has tables already prepared and shows each as it is dealt with.

Discussion, reasoning, agreement, praising

Activity | ***Notes***

3

(Continued)

Different methods of solution:

a) Use metres and cm in a table.

1st day: 2 m 70 cm

2nd day: 3.8 m = 3 m 80 cm

3rd day: 4 m

4th day: $3\frac{6}{10}$ m = 3 m 60 cm

	10 m	1 m	10 cm	1 cm
		2	7	0
		3	8	0
		4	0	0
+		3	6	0
	1	4	1	0
		2		

Answer: The trench was 14 m 10 cm long.

b) Use 1 cm as 1 unit and write in a place-value table.

2 m 70 cm = 270 cm

3.8 m = 3 m 80 cm = 380 cm

4 m = 400 cm

$3\frac{6}{10}$ m = 3 m 60 cm = 360 cm

	Th	H	T	U	
		2	7	0	
		3	8	0	
		4	0	0	
+		3	6	0	
	1	4	1	0	(cm)
		2			

Answer: The trench was 1410 cm long.

c) Use 1 m as 1 unit and write in a place-value table.

2 m 70 cm = 2.70 m

3.8 m

4 m

$3\frac{6}{10}$ m = 3.6 m

	T	U	t	h	
		2	7	0	
		3	8		
		4			
+		3	6		
	1	4	1	0	(m)
		2			

Answer: The trench was 14.10 m long.

Agree that $\frac{10}{100} = \frac{1}{10}$,
so 14.10 m = 14.1 m

d) Write an addition using 1 m as 1 unit <u>without</u> a place-value table.

$$\text{BB:}\quad 2\text{ m }70\text{ cm} = \left(2 + \frac{7}{10}\right)\text{ m} \rightarrow \quad 2.7\text{ m}$$

$$3.8\text{ m} = \left(3 + \frac{8}{10}\right)\text{ m} \rightarrow \quad 3.8\text{ m}$$

$$4\text{ m} = \left(4 + \frac{0}{10}\right)\text{ m} \rightarrow \quad 4.0\text{ m}$$

$$3\frac{6}{10}\text{ m} = \underline{\left(3 + \frac{6}{10}\right)} \rightarrow \quad + \ \underline{3.6\text{ m}}$$

$$\left(12 + \frac{21}{10}\right)\text{ m} = \left(14 + \frac{1}{10}\right) = \underline{14.1\text{ m}}$$

Answer: The trench was 14.1 m long.

20 min

Bk4

Lesson Plan 77

Activity

Notes

4

Problem 2

Listen carefully and think how you would solve the problem.

We had 50.8 m of ribbon and used 14.1 m. What length is left?

T suggests ways of solving but Ps come to BB to carry it out. Class points out errors.

BB: Methods of solution e.g.

a) Using m and cm in a table:

50.8 m = 50 m 80 cm

14.1 m = 14 m 10 cm

Answer: 36 m 70 cm is left.

	10 m	1 m	10 cm	1 cm
	5	^{10} 0	8	0
−	1 $_1$	4	1	0
	3	6	7	0

b) Using cm as the unit:

50.8 m = 5080 cm

14.1 m = 1410 cm

$$\begin{array}{r} 5080 \\ -\ \underline{1410} \\ \underline{3670} \end{array} \text{ (cm)}$$

c) Using m as the unit:

$$\begin{array}{r} 50.8 \\ -\ \underline{14.1} \\ \underline{36.7} \end{array} \text{ (m)}$$

d) Using fractions:

$$\begin{array}{rcl} 50.8 & = & 50 + \frac{8}{10} \text{ (m)} \\ -\ \underline{14.1} & = & \underline{14 + \frac{1}{10}} \text{ (m)} \\ \underline{36.7} & \leftarrow & \underline{36 + \frac{7}{10}} = 36\frac{7}{10} \text{ (m)} \end{array}$$

Answer: There are 36.7 metres of ribbon left.

25 min

Whole class activity

Or Ps suggest methods of solution and T chooses which to use.

Reasoning, agreement, praising

Table drawn on BB. Ps dictate the column headings.

(Without a table)

Changing decimals to fractions, doing the calculation, then converting back to a decimal.

[T points out that the answer could be given in different forms but that if only one form is used in the question (decimals in this case), then usually the answer is given in the same form.]

5

Book 4, page 77

Q.1 Read: *Add the quantities in the different units. Write the addition in the table.*

Deal with one part at a time. Set a time limit.

Review at BB with whole class. Ps come to BB to BB to write addtions and fill in the table, explaining reasoning. Class points out errors. Mistakes discussed and corrected.

Solution:

a) 1.1 m + 230 cm + 8600 mm

In mm

	1	1	0	0
	2	3	0	0
+	8	6	0	0
1	2	0	0	0
	1			

In cm

	1	1	0
	2	3	0
+	8	6	0
1	2	0	0
	1		

In m

	1	.1
	2	.3
+	8	.6
1	2	.0
	1	

	10 m	1 m	10 cm	1 cm
		1	1	0
		2	3	0
+		8	6	0
	1	2	0	0
		1		

b) 13.4 litres + 1580 cl + 2500 ml

In ml

	1	3	4	0	0
	1	5	8	0	0
+		2	5	0	0
	3	1	7	0	0
	1	1			

In cl

	1	3	4	0
	1	5	8	0
+		2	5	0
	3	1	7	0
	1	1		

In litres

	1	3	.4
	1	5	.8
+		2	.5
	3	1	.7
	1	1	

	10 ℓ	1 ℓ	10 cl	1 cl
	1	3	4	0
	1	5	8	0
+		2	5	0
	3	1	7	0
	1	1		

32 min

Individual trial, monitored, helped

(Or part a) with whole class first, b) as individual work)

Written on BB or use enlarged copy master or OHP

Discussion, reasoning, self-correcting, praising

T points to each answer in turn and class reads it in unison, saying the appropriate unit too.

In good humour!

Reassure Ps who are finding the concept difficult – there will be lots of practice later on!

Bk4

Lesson Plan 77

Activity		***Notes***

6

Book 4, page 77

Q.2 Read: *Subtract the quantities in the different units. Write the subtractions in the table.*

Deal with one part at a time. Set a time limit.

Review at BB with whole class. Ps come to BB to BB to write addtions and fill in the table, explaining reasoning. Class points out errors. Mistakes discussed and corrected.

Solution:

a) 4.73 m – 210 cm

In mm

$$\begin{array}{rcccc} & 4 & 7 & 3 & 0 \\ - & 2 & 1 & 0 & 0 \\ \hline & 2 & 6 & 3 & 0 \end{array}$$

In cm

$$\begin{array}{rccc} & 4 & 7 & 3 \\ - & 2 & 1 & 0 \\ \hline & 2 & 6 & 3 \end{array}$$

In m

$$\begin{array}{rccc} & 4. & 7 & 3 \\ - & 2. & 1 & 0 \\ \hline & 2. & 6 & 3 \end{array}$$

	1 m	10cm	1 cm
	4	7	3
–	2	1	0
	2	6	3

b) 18.6 litres – 7900 ml

In ml

$$\begin{array}{rccccc} & 1 & 8 & {}^{10}6 & 0 & 0 \\ - & & 7_1 & 9 & 0 & 0 \\ \hline & 1 & 0 & 7 & 0 & 0 \end{array}$$

In cl

$$\begin{array}{rcccc} & 1 & 8 & {}^{10}6 & 0 \\ - & & 7_1 & 9 & 0 \\ \hline & 1 & 0 & 7 & 0 \end{array}$$

In litres

$$\begin{array}{rcccc} & 1 & 8. & {}^{10}6 & 0 \\ - & & 7_1. & 9 & 0 \\ \hline & 1 & 0. & 7 & 0 \end{array}$$

	10 ℓ	1 ℓ	10 cl	1 cl
	1	8	^{10} 6	0
–		7 $_1$	9	0
	1	0	7	0

Individual trial, monitored, helped

(Or part a) with whole class first, b) as individual work)

Written on BB or use enlarged copy master or OHP

Discussion, reasoning, self-correcting, praising

T points to each answer in turn and chooses Ps to read it aloud, saying the appropriate unit too.

In good humour!

39 min

7

Book 4, page 77, Q.3

Read: *Calculate with fractions and decimals. Follow the example.*

a) Ps come to BB to complete the next two rows, explaining reasoning (with T's help if necessary). Class agrees/disagrees.

Now let's do the additions. Ps come to BB or dictate to T, explaining reasoning. Class agrees/disagrees. Ps work in *Pbs* too.

Solution:

$$\begin{array}{rclclcr} 4.9 & = & 4 + \frac{9}{10} & = & 4 + \frac{90}{100} & = & 4.90 \\ 10.23 & = & 10 + \frac{2}{10} + \frac{3}{100} & = & 10 + \frac{23}{100} & = & 10.23 \\ +\ 7.04 & = & 7 + \frac{0}{10} + \frac{4}{100} & = & 7 + \frac{4}{100} & = & 7.04 \\ \hline 22.17 & = & 21 + \frac{11}{10} + \frac{7}{100} & = & 21 + \frac{117}{100} & = & 22.17 \\ & = & 22 + \frac{1}{10} + \frac{7}{100} & = & 22 + \frac{17}{100} & & \end{array}$$

b) Let's see if you can do this subtraction in the same way in your Ex. Bks! Set a time limit. (If Ps are having difficulty, stop them and continue as a whole class activity.)

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

Solution:

$$\begin{array}{rclclcr} 6.81 & = & 6 + \frac{8}{10} + \frac{1}{100} & = & 6 + \frac{81}{100} & = & 6.81 \\ -\ \ 2.7 & = & 2 + \frac{7}{10} & = & 2 + \frac{70}{100} & = & 2.70 \\ \hline 4.11 & = & 4 + \frac{1}{10} + \frac{1}{100} & = & 4 + \frac{11}{100} & = & 4.11 \end{array}$$

Whole class activity

(or individual work if Ps wish)

Written on BB or use enlarged copy master or OHP

At a good pace

Discussion, reasoning, (self-correcting), praising

Agree that 4.9 = 4.90

Stress the importance of keeping the same place values lined up vertically.

Individual trial, monitored, helped

(or whole class activity if Ps are still unsure)

Reasoning, agreement, self-correcting, praising

Agree that 2.7 = 2.70

Extra praise for Ps who did part b) correctly without help.

Feedback for T

45 min

Bk4

R: Calculations

C: Addition and subtraction of decimals (1 decimal place)

E: 2 decimal places. Problems (3 decimal places)

Lesson Plan 78

Activity

1

Fractions and decimals

T has diagrams on BB showing parts of a unit. Let's write the parts as fractions and as decimals.

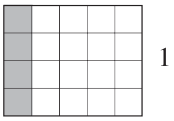
Ps come to BB, say the number of parts the unit has been divided into and how many of the parts have been coloured.

Then other Ps write it as a fraction and as a decimal. T helps with enlarging the fractions to whole 10s (100s, 1000s) before converting to decimal form. (Agree that multiplying the numerator and denominator of a fraction by the same amount does not change the value of the fraction.) Class agrees/disagrees.

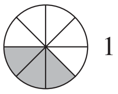
BB: e.g.

a) 

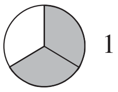
$\frac{3}{10} = 0.3$

b) 

$\frac{4}{20} = \frac{1}{5} = \frac{2}{10} = 0.2$

c) 

$\frac{3}{8} = \frac{3 \times 125}{8 \times 125} = \frac{375}{1000} = 0.375$

d) 

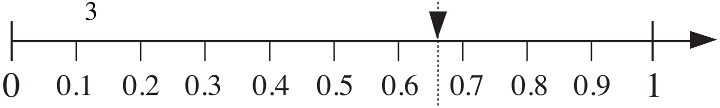
$\frac{2}{3} = \frac{6}{9} = \frac{66}{99} > \frac{66}{100} = 0.66$

Extension

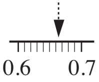
Let's show it on the number line. T demonstrates (with help of Ps).

BB: 1 third < 2 thirds < 1

$0.6 < \frac{2}{3} < 0.7$



$0.66 < \frac{2}{3} < 0.67$



Let's se if you can calculate these fractions of a quantity. What is:

a) $\frac{3}{10}$ of 1 m: 100 cm ÷ 10 × 3 = 10 cm × 3 = 30 cm = <u>0.3 m</u>

$\frac{1}{10}$ of 3 m: 300 cm ÷ 10 = 30 cm = <u>0.3 m</u>

b) $\frac{4}{20}$ of 1 ℓ: 100 cl ÷ 20 × 4 = 5 cl × 4 = 20 cl = <u>0.2 litre</u>

c) $\frac{3}{8}$ of 1 kg: 1000 g ÷ 8 × 3 = 125 g × 3 = 375 g = <u>0.375 kg</u>

d) $\frac{2}{3}$ of 1 m: 100 cm ÷ 3 × 2 = $\left(33 + \frac{1}{3}\right)$ cm × 2 = $\left(66 + \frac{2}{3}\right)$ cm

= <u>0.66 m + 2 thirds of a cm</u>

10 min

Notes

Whole class activity

Diagrams drawn on BB or use enlarged copy master or OHP

Reasoning, agreement, praising

At difficult items, first allow Ps time to think about it and suggest what to do; otherwise T gives hints or demonstrates how to do it, explaining reasoning in detail.

Hint: 1000 = 8 × 125

3 × 125 = 300 + 60 + 15 = 375

Difficult problem! How can we convert 2 thirds into a decimal?

If Ps have no idea, T reminds them about comparing with smaller and greater numbers by writing inequalities.

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

Elicit that: $\frac{2}{3} \approx 0.7$ (to 1 d.p.)

$\frac{2}{3} \approx 0.67$ (to 2 d.p.)

But stress that Ps do not have to learn it!

Ps come to BB or dictate to T. Class agreees/disgrees.

Elicit that :

$\frac{3}{10}$ of 1 = $\frac{1}{10}$ of 3

$\frac{1}{20}$ of 4 litres? (0.2 litres)

$\frac{1}{8}$ of 3 kg? (0.375 kg)

BB: 100 ÷ 3 = (99 + 1) ÷ 3
= 33 + 1 third

$\frac{1}{3}$ of 2 m? (0.66 m + $\frac{2}{3}$ cm)

Activity | *Notes*

2

Sequences

T says the first few terms of a sequence. Ps say the following terms. Class points out errors. What is the rule? Who agrees? etc.

a) 4.3, 5.0, 5.7, (6.4, 7.1, 7.8, 8.5, 9.2, 9.9, 10.6, 11.3, 12, . . .)
Rule: Increasing by 0.7 (+ 0.7)

b) 8.7, 7.6, 6.5, (5.4, 4.3, 3.2, 2.1, 1, (– 0.1, – 1.2, – 2.3, . . .)
Rule: Decreasing by 1.1 (– 1.1)

c) 0.2, 0.3, 0.5, 0.8, (1.2, 1.7, 2.3, 3, 3.8, 4.7, 5.7, 6.8, 8, . . .)
Rule: The difference between terms is increasing by 0.1.

16 min

Whole class activity

T chooses Ps at random (or in order round class)

At a good pace

T decides when to stop.

Discussion, checking, agreement on the rule.

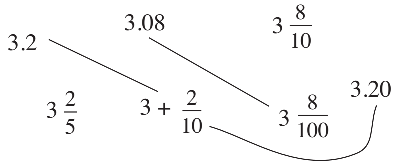
Write this sequence on BB and show the difference sequence:
0.1, 0.2, 0.3, 0.4, 0.5, . . .

3

Equal numbers

Let's join up the equal numbers. Ps come to BB to draw joining lines. Class agrees/disagrees.

BB:



Ps think of decimals equal to the two numbers which are not joined up.

20 min

Whole class activity

Written on BB or SB or OHT

Reasoning, agreement, praising

(3.4, 3.40; 3.8, 3.80)

4

Adding and subtracting decimals

Let's read the addition (subtraction) first. Who can give me an estimate of the result? Who agrees? etc.

Ps come to BB to fill in the place-value table, explaining reasoning. Class points out errors. Who can do the calculation without the table? Ps come to BB to write the addition (subtraction), explaining what they are doing. Class agrees/disagrees.

BB:

a) 7.3 + 6.81 = (14.11)
(≈ 7 + 7 = 14)

	T	U	t	h
		7	3	
+		6	8	1
	1	4	1	1
		1		

		7 •	3	(0)
+		6 •	8	1
	1	4 •	1	1
		1		

b) 22.8 – 13 = (9.8)
(≈ 23 – 13 = 10)

	T	U	t	h
	2	$^{10}2$	8	
–	1_1	3		
		9	8	

	2	$^{10}2$ •	8	
–	1_1	3 •	(0)	
		9 •	8	

Whole class activity

Written on BB or use enlarged copy master or OHP

At a good pace

Reasoning, agreement, checking against estimate, praising

Extension

If these values were in metres (cm), what would they be in cm (mm)?

a) 7.3 m + 6.81 m = 730 cm + 681 cm = 1411 cm
7.3 cm + 6.81 cm = 73 mm + 68.1 mm = 141.1 mm

b) 22.8 m – 13 m = 2280 cm – 1300 cm = 980 cm
22.8 cm – 13 cm = 228 mm – 130 mm = 98 mm

25 min

or BB:

a) $\begin{array}{r} 730\text{ cm} \\ +\,681\text{ cm} \\ \hline 1411\text{ cm} \\ \hline \end{array}$ $\quad \begin{array}{r} 73.0\text{ mm} \\ +\,68.1\text{ mm} \\ \hline 141.1\text{ mm} \\ \hline \end{array}$

b) $\begin{array}{r} 2280\text{ cm} \\ -\,1300\text{ cm} \\ \hline 980\text{ cm} \\ \hline \end{array}$ $\quad \begin{array}{r} 228\text{ mm} \\ -\,130\text{ mm} \\ \hline 98\text{ mm} \\ \hline \end{array}$

Bk4

Lesson Plan 78

Activity		*Notes*

5

Book 4, page 78

Q.1 Read: *Continue each sequence for the next 5 terms.*
Write down the rule you used.

Set a time limit. Review at BB with whole class. Ps come to BB or dictate terms to T, saying the rule too. Who did the same? Who used another rule? etc. Deal with all cases. Mistakes discussed and corrected.

Solution:

a) 0.2, 0.4, 0.6, 0.8, (1, 1.2, 1.4, 1.6, 1.8,) [+ 0.2]

c) 12.1, 11.8, 11.5, 11.2, (10.9, 10.6, 10.3, 10, 9.7,) [– 0.3]

d) 1, 1.1, 1.3, 1.6, 2, 2.5, (3.1, 3.8, 4.6, 5.5, 6.5,)
0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0

Rule: Difference between terms is increasing by 0.1.

Individual work, monitored, helped

Written on BB or SB or OHT

Differentiation by time limit

Reasoning, agreement, self-correction, praising

(Accept any rule which is reasoned correctly.)

Show the difference sequence on the BB.

30 min

6

Book 4, page 78

Q.2 Read: *Calculate these quantities. Write the operation, then give the result in cm and m. Follow the example.*

T (or a P) explains part a) to whole class first if necessary.

Set a time limit. Ps can do calculations in *Ex. Bks*.

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

Solution:

a) $\frac{1}{4}$ of 3 m = 300 cm ÷ 4 = 75 cm = 0.75 m

b) $\frac{3}{4}$ of 1 m = $\overset{25\text{ cm}}{100\text{ cm} \div 4} \times 3$ = 75 cm = 0.75 m

c) $\frac{1}{5}$ of 2 m = 200 cm ÷ 5 = 40 cm = 0.40 m = 0.4 m

d) $\frac{2}{5}$ of 1 m = $\overset{20\text{ cm}}{100\text{ cm} \div 5} \times 2$ = 40 cm = 0.40 m = 0.4 m

e) 75 cm + 40 cm = 115 cm = <u>1.15 m</u>

or $\frac{3}{4} + \frac{2}{5} = \frac{75 + 40}{100} = \frac{115}{100} = 1\frac{15}{100}$ (m)

Individual work, monitored, helped

Written on BB or SB or OHT

Reasoning, agreement. self-correction, praising

Elicit that: $\frac{1}{4}$ of 3 = $\frac{3}{4}$ of 1

$\frac{1}{5}$ of 2 = $\frac{2}{5}$ of 1

Ps think of other examples,

e.g. $\frac{1}{8}$ of 3 = $\frac{3}{8}$ of 1, etc.

Feedback for T

36 min

Bk4

Lesson Plan 78

Activity

7

Book 4, page 78

Q.3 Read: *Estimate the result by rounding the numbers to the nearest whole number. Write the additions and subtractions in the tables.*

T could ask for the estimates orally first.

If you think that you can do the operations <u>without</u> using a place-value table, try it in your *Ex. Bks*. Set a time limit.

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

Who can do the calculation without using the place-value table? Ps come to BB to write the operation with decimals, explaining reasoning in detail. Class checks by comparing with estimate.

Solution:

a) 1.1 + 42.6 + 0.8

≈ 1 + 43 + 1 = 45

	T	U	t
		1	1
	4	2	6
+		0	8
	4	4	5
		1	

b) 62 + 6.2 + 0.62

≈ 62 + 6 + 1 = 69

	T	U	t	h
	6	2		
		6	2	
+		0	6	2
	6	8	8	2

c) 22.5 – 13.7

≈ 23 – 14 = 9

	T	U	t
	2	$^{10}2$	$^{10}5$
–	1_1	3_1	7
		8	8

$$\begin{array}{r} 22.5 \\ -\ 13.7 \\ \hline 8.8 \\ \hline \end{array}$$

d) 32.8 – 13

≈ 33 – 13 = 20

	T	U	t
	3	$^{10}2$	8
–	1_1	3	
	1	9	8

$$\begin{array}{r} 32.8 \\ -\ 13.0 \\ \hline 19.8 \\ \hline \end{array}$$

e) 32 – 13.7

≈ 32 – 14 = 18

	T	U	t
	3	$^{10}2$	^{10}
–	1_1	3_1	7
	1	8	3

$$\begin{array}{r} 32.0 \\ -\ 13.7 \\ \hline 18.3 \\ \hline \end{array}$$

45 min

Notes

Individual work, monitored, helped

Written on BB or use enlarged copy master or OHP

Elicit that the thick line in the table means the same as the <u>decimal point</u> (i.e. it separates the whole units from the parts)

Differentiation by time limit

Reasoning, agreement, self-correction, paising

Let's give them a clap!

BB:

a)
$$\begin{array}{r} 1.1 \\ 42.6 \\ +\ 0.8 \\ \hline 44.5 \\ \hline \end{array}$$

b)
$$\begin{array}{r} 62.00 \\ 6.20 \\ +\ 0.62 \\ \hline 68.82 \\ \hline \end{array}$$

Bk4

R: Calculations
C: Addition and subtraction of decimals
E: Problems

Lesson Plan 79

Activity | *Notes*

1

Fractions and decimals

I will say a number. Show me it as a fraction, then as a decimal, when I say. e.g.

T's Number:	Fraction	Decimal
a) Three tenths	$\frac{3}{10}$	0.3
b) One half	$\frac{1}{2}$	0.5
c) Twenty-seven hundredths	$\frac{27}{100}$	0.27
d) Two point six four	$2\frac{64}{100}$	2.64
e) Seven point zero four	$7\frac{4}{100}$	7.04
f) Ninety-eight and twenty-five hundredths	$98\frac{25}{100}$	98.25

etc.

6 min

Individual work but class kept together

Responses shown on scrap paper or slates in unison on command

Agreement, praising

Ps who were correct explain to those who were wrong.

Show on a diagram or number line if problems.

Feedback for T

Ps can ask the numbers too!

2

Completing to 1

T says a number. Ps say an addition or subtraction to result in 1. Other Ps are at BB to write it. Class points out errors.

e.g. T: 0.7, P_1: '$0.7 + \underline{0.3} = 1$'; T: 5 twelfths, P_2: '5 twelfths + $\underline{\text{7 twelfths}}$ = 1'; T: 0.97, P_3: '$0.97 + \underline{0.03} = 1$';

T: 10 hundredths, P_4: '10 hundredths + $\underline{\text{90 hundredths}}$ = 1';

T: 13 tenths. P_5: '13 tenths minus $\underline{\text{3 tenths}}$ = 1', etc.

Ps can give the starting number instead of the T.

11 min

Whole class activity

At speed

Agreement, praising

Show on number line or other model if problems.

Feedback for T

3

Rounding

Let's round these decimals. Ps come to BB or dictate what T should write. Class agrees/disgrees.

BB:

a) Round to the nearest whole number:

$0.3 \approx (0)$, $0.5 \approx (1)$, $0.49 \approx (0)$, $0.51 \approx (1)$, $0.7 \approx (1)$

$1.3 \approx (1)$, $4.1 \approx (4)$, $5.6 \approx (6)$, $5.49 \approx (5)$, $5.51 \approx (6)$

b) Round to the nearest tenth:

$0.71 \approx (0.7)$, $0.75 \approx (0.8)$, $0.06 \approx (0.1)$, $0.18 \approx (0.2)$

$3.14 \approx (3.1)$, $15.06 \approx (15.1)$, $4.38 \approx (4.4)$, $7.25 \approx (7.3)$, etc.

17 min

Whole class activity

Written on BB or SB or OHT

At a good pace

Show on relevant segment of the number line drawn on BB if problems.

Agree that $0.\underline{5}$ rounds $\underline{\text{up}}$ to next whole unit. 1.0

Agree that $0.0\underline{5}$ rounds $\underline{\text{up}}$ to next whole tenth, 0.1

or $15.06 \approx 15.10$,
$7.25 \approx 7.30$

4

Mental practice

T throws a ball to a P saying an addition or subtraction involving decimals. P throws ball back to T saying result. e.g.

$0.2 + 0.3 = \underline{0.5}$, $0.9 - 0.4 = \underline{0.5}$, $1.3 + 2.4 = \underline{3.7}$, $4.1 - 0.7 = \underline{3.4}$,

$1 - 0.7 = \underline{0.3}$, $1 + 2.5 = \underline{3.5}$, etc.

22 min

Whole class activity

At speed

Class points out errors.

Praising, encouragement only

Bk4

Lesson Plan 79

Activity

Notes

5

Book 4, page 79

Q.1 Read: *Calculate the sums and differences in different ways.*

Use at least 2 different ways. If you need more room, do the calculations in your *Ex. Bks*.

Review at BB with whole class. T chooses Ps to show their methods on the BB. Who did it another way? etc. Deal with all cases. Mistakes discussed and corrected.

Solution: e.g.

a) $6.8 + 4.7 = 6 + 4 + 0.8 + 0.7 = 10 + 1.5 = \underline{11.5}$, or

$$6\frac{8}{10} + 4\frac{7}{10} = 10 + \frac{15}{10} = 10 + 1\frac{5}{10} = 11\frac{5}{10}\ (= 11\frac{1}{2})$$

b) $2\frac{1}{10} + 3\frac{4}{10} = 5 + \frac{5}{10} = 5\frac{5}{10}\ (= 5\frac{1}{2})$; $2.1 + 3.4 = \underline{5\ .5}$

c) $5.2 - 1.6 = 4.2 - 0.6 = \underline{3.6}$; $5\frac{2}{10} - 1\frac{6}{10} = 4 - \frac{4}{10} = 3\frac{6}{10}$

d) $6\frac{8}{10} - 1\frac{7}{10} = \frac{68}{10} - \frac{17}{10} = \frac{51}{10} = 5\frac{1}{10}$; $6.8 - 1.7 = \underline{5.1}$

e) $4\frac{3}{10} + 11.8 = 4.3 + 11.8 = 15 + 1.1 = \underline{16.1}$;

$$4\frac{3}{10} + 11\frac{8}{10} = 15 + \frac{11}{10} = 15 + 1\frac{1}{10} = 16\frac{1}{10}$$

f) $7.2 - 3\frac{6}{10} = 7.2 - 3.6 = 4.2 - 0.6 = \underline{3.6}$;

$$7\frac{2}{10} - 3\frac{6}{10} = 6\frac{12}{10} - 3\frac{6}{10} = 3\frac{6}{10}$$

Individual work, monitored, helped

Written on BB or SB or OHT

Allow Ps to think of own ways of calculating. T notes interesting methods while monitoring.

Accept any correct method

Reasoning given in detail (with T's help)

Agreement, self-correction, praising

or, e.g. using place value tables or vertical addition or subtraction, e.g.

a) $$\begin{array}{r} 6.8 \\ +\ 4.7 \\ \hline 11.5 \\ \hline \end{array}$$

c) $$\begin{array}{r} 5.2 \\ -\ 1.6 \\ \hline 3.6 \\ \hline \end{array}$$

Extra praise if Ps point out:

$$\frac{6}{10} = \frac{3}{5}$$

28 min

6

Book 4, page 79

Q.2 Let's see how many of these you can do in 4 minutes! Remember to check your results! Start . . . now! . . . Stop!

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

Who had all 6 correct? Let's give them a round of applause!

Solution:

a) $$\begin{array}{cccc} & & 2. & 4 \\ & 1 & 0. & 3 \\ + & 8 & 7. & 2 \\ \hline & 9 & 9. & 9 \end{array}$$

b) $$\begin{array}{cccc} & & {\scriptstyle 1} & \\ & 4 & 2. & 1 \\ & & 5. & 6 \\ + & & 0. & 7 \\ \hline & 4 & 8. & 4 \end{array}$$

c) $$\begin{array}{ccccc} & {\scriptstyle 1} & {\scriptstyle 1} & {\scriptstyle 1} & \\ & 1 & 2 & 3. & 6 \\ & & 1 & 7. & 2 \\ + & 4 & 9 & 5. & 8 \\ \hline & 6 & 3 & 6. & 6 \end{array}$$

d) $$\begin{array}{cccccc} & & & {\scriptstyle 1} & {\scriptstyle 2} & \\ & 6 & 0 & 0 & 0. & 8 \\ & & 4 & 0 & 9. & 4 \\ + & 1 & 0 & 2 & 6. & 9 \\ \hline & 7 & 4 & 3 & 7. & 1 \end{array}$$

e) $$\begin{array}{ccccc} & {\scriptstyle 1} & {\scriptstyle 1} & & \\ & 1 & 0. & 5 & \\ & & 4. & 6 & 5 \\ + & 2 & 3. & 1 & 7 \\ \hline & 3 & 8. & 3 & 2 \end{array}$$

f) $$\begin{array}{ccccc} & 1 & 3 & & \\ & & 0. & 9 & \\ + & & 3. & 0 & 5 \\ \hline & 1 & 6. & 9 & 5 \end{array}$$

Individual work, monitored, helped

Written on BB or use enlarged copy master or OHP

Differentiation by time limit

Reasoning, agreement, self-correction, praising

Checking by adding in opposite direction (or could also be done with a calculator)

T points to a result and chooses a P to read it aloud.

34 min

Bk4

Lesson Plan 79

Activity | ***Notes***

7

Book 4, page 79

Q.3 Let's see how many of these you can do in 4 minutes! Remember to check your results! Start . . . now! . . . Stop!

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

Who had all 6 correct? Let's give them 3 cheers!

Solution:

a) $$\begin{array}{cccc} & 4 & 9. & 6 \\ - & 1 & 6. & 2 \\ \hline & 3 & 3. & 4 \end{array}$$

b) $$\begin{array}{cccc} & 8 & 9. & {}^{10}5 \\ - & 5 & 2_1. & 6 \\ \hline & 3 & 6. & 9 \end{array}$$

c) $$\begin{array}{ccccc} & 4 & 2. & {}^{10}1 & 5 \\ - & & 8_1. & 9 & \\ \hline & 3 & 3. & 2 & 5 \end{array}$$

d) $$\begin{array}{ccccc} & 8 & {}^{10}5. & 4 & {}^{10} \\ - & 1_1 & 6. & 2_1 & 7 \\ \hline & 6 & 9. & 1 & 3 \end{array}$$

e) $$\begin{array}{ccccc} & 6 & {}^{10}5. & 6 & 4 \\ - & 3_1 & 9. & 3 & \\ \hline & 2 & 6. & 3 & 4 \end{array}$$

f) $$\begin{array}{cccc} & 4 & {}^{10}0 & {}^{10} \\ - & 3_1 & 5_1. & 6 \\ \hline & & 4. & 4 \end{array}$$

40 min

Individual work, monitored, helped

Written on BB or use enlarged copy master or OHP

Differentiation by time limit

Reasoning, agreement, self-correction, praising

Checking with an addition, subtraction or a calculator.

T chooses Ps to say the results in decreasing order.

8

Book 4, page 79, Q.4

Read: *Charlie went on a shopping spree. He spent £29.80 on food, £37.60 on tools, £30.50 on things for his house and £38.50 on clothes.*

a) How much did Charlie spend altogether?

b) How much money did he have left if he had £200 to start with?

Ps do calculations in *Ex. Bks*, then show the results on scrap paper or slates on command. Ps answering correctly explain at BB to those who did not. Mistakes discussed and corrected.

Solution: Spent: $$\begin{array}{r} £29.80 \\ £37.60 \\ £30.50 \\ +\ £38.50 \\ \hline £136.40 \\ \hline \end{array}$$ Had left: $$\begin{array}{r} £200.00 \\ -\ £136.40 \\ \hline £\ \ 63.60 \\ \hline \end{array}$$

Or show in money and place-value tables first. T draws tables on BB and Ps dictate the headings. Ps come to BB to write the amounts in the correct columns. Class points out errors.

BB:

Using £s and pence

	£100	£10	£1	10 p	1 p
		2	9	8	0
		3	7	6	0
		3	0	5	0
+		3	8	5	0
	1	3	6	4	0
		2	2		

Using £s

	H £100	T £10	U £1	t £ $\frac{1}{10}$	h £ $\frac{1}{100}$
		2	9	8	0
		3	7	6	0
		3	0	5	0
+		3	8	5	0
	1	3	6	4	0
		2	2		

Answer: Charlie spent £136.40 altogether and had £63.60 left.

45 min

Whole class activity but individual calculation

In unison

Reasoning, agreement, self-correcting, praising

Whole class activity

Drawn on BB or SB or OHT

At a good pace

Agreement, checking, praising

Check:

£136.40 + £63.60 = £200 ✔

Bk4

R: Mental calculation

C: Addition and subtraction of decimals

E: Problems

Lesson Plan 80

Activity | *Notes*

1

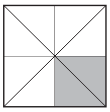
Models of fractions and decimals

Study each diagram. What part of it is shaded? What part is not shaded?

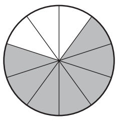
Ps come to BB to write the parts as fractions and decimals, simplifying the fractions where possible. Class agrees/disagrees.

BB:

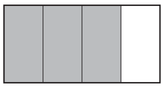
a) 1 unit



b) 1 unit

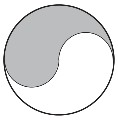


c) 1 unit

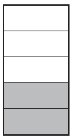


	a)	b)	c)
Shaded:	$\frac{2}{8} = \frac{1}{4} = 0.25$	$\frac{7}{10} = 0.7$	$\frac{3}{4} = 0.75$
Unshaded:	$\frac{6}{8} = \frac{3}{4} = 0.75$	$\frac{3}{10} = 0.3$	$\frac{1}{4} = 0.25$

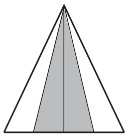
d) 1 unit



e) 1 unit



f) 1 unit



	d)	e)	f)
Shaded:	$\frac{1}{2} = 0.5$	$\frac{2}{5} = 0.4$	$\frac{2}{4} = \frac{1}{2} = 0.5$
Unshaded:	$\frac{1}{2} = 0.5$	$\frac{3}{5} = 0.6$	$\frac{2}{4} = \frac{1}{2} = 0.5$

Whole class activity

Drawn onBB or use enlarged copy master or OHP

At a good pace

Reasoning, agreement, praising

(Ps might begin to remember equivalent fractions and decimals for quarters, fifths and eighths)

If Ps question whether the parts in f) are equal, T assures them that they are equal, but that we will prove it in a later lesson.

5 min

2

Inequalities

Which decimal is more? How much more? Ps come to BB to write the missing signs and calculate the differences. Class agrees/disagrees. Show on number line if problems, expecially the negative decimal.

BB:

a) 0.21 $\boxed{<}$ 0.8 (0.80) (0.59)

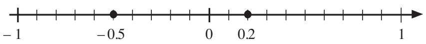
b) 4.2 $\boxed{>}$ 2.9 (1.3)

c) 1.03 $\boxed{<}$ 1.3 (1.30) (0.27)

d) 0.2 $\boxed{>}$ 0 (0.2)

e) 1.5 $\boxed{<}$ 2 (0.5)

f) 0.2 $\boxed{>}$ – 0.5 (0.7)



Whole class activity.

Written on BB or SB or OHT

Discussion, reasoning, agreement, praising

Elicit that:

0 = 0.0 and 2 = 2.0

Who can explain what – 0.5 means?

Show on number line as opposite or use a context, e.g. owing someone 50 p, (i.e. – £0.5 in debt)

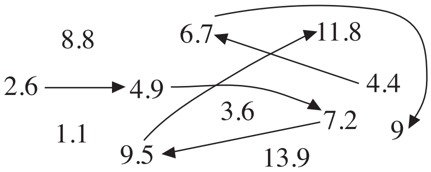
10 min

3

Comparing decimals

Let's draw arrows pointing towards a number which is 2.3 more.
Ps come to BB to draw arrows. Class agrees/disagrees.

BB:



What operation could we write above the arrows? (+ 2.3) If the arrows pointed in the opposite direction, what would they mean? (– 2.3)

Whole class activity.

Written on BB or SB or OHT

At a good pace

Reasoning, agreement, praising

Feedback for T

13 min

Bk4

Lesson Plan 80

Activity

Notes

4

Mental practice

I will ask you some questions. Do the calculation in your head and show me the result on scrap paper or slates when I say.

a) *What should we add to 1.2 to get 1.7?* Show me . . . now! (0.5)

BB: $1.2 + \underline{0.5} = 1.7$ or $1.7 - 1.2 = \underline{0.5}$

b) *What should we add to 2.6 to get 2.60?* Show me . . . now! (0)

BB: $2.6 = 2.60$, because $2\frac{6}{10} = 2\frac{60}{100}$

c) *What should we subtract from 4.5 to get 1.9?* Show me . . . now! (2.6)

BB: $4.5 - \underline{2.6} = 1.9$ or $4.5 - 1.9 = \underline{2.6}$

etc.

20 min

Whole class activity

(Less able Ps can do the calculations in *Ex. Bks* or on slates.)

Responses shown in unison.

Ps responding correctly come to BB to explain reasoning.

Agreement, praising

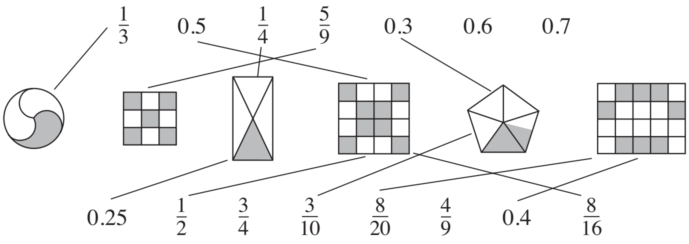
5

Book 4, page 80

Q.1 Read: *How much of each shape has been shaded? Join up the fractions to the matching diagrams.*

Set a time limit. Review with whole class. Ps come to BB to draw joining lines, explaining reasoning. Class agrees/disagrees Mistakes discussed and corrected.

Solution:



What part of each shape is not shaded? T points to each diagram in turn and class says the unshaded part.

25 min

Individual work, monitored, helped

Drawn on BB or use enlarged copy master or OHP

Reasoning, agreement, self-correcting, praising

Agree that there are no diagrams which have 0.6, 0.7 or 3 quarters shaded.

At a good pace

Class points out errors.

Praising

6

Book 4, page 80

Q.2 Read: *Which number is more? How much more? Write the missing signs and differences.*

Ps can do calculations in *Ex. Bks* if necessary. Set a time limit.

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

T asks Ps to say the inequalities using tenths or hundreds. (e.g. a): 70 hundredths is 38 hundredths more than 32 hundredths)

Solution:

a) $0.7 \underset{0.38}{>} 0.32$ b) $5.8 \underset{1.3}{<} 7.1$ c) $2.5 \underset{0.45}{>} 2.05$

d) $0.50 \underset{0}{=} 0.5$ e) $3.2 \underset{0.8}{<} 4$ f) $0.6 \underset{0.06}{<} 0.66$

30 min

Individual work, monitored, helped

Written on BB or SB or OHT

Reasoning, agreement, self-correcting, praising

T chooses Ps at random.

Class points out errors.

Praising, encouragement only

Bk4

Lesson Plan 80

Activity | ***Notes***

7

Book 4, page 80

Q.3 Read: *Solve the problem in your exercise book.*

Ps read problem themselves, draw a digram, write a plan, do the calculation, check it and write the answer as a sentence.

Set a time limit. Ps discuss it with their neighbours if they wish.

Review with whole class. Ps could show result on scrap paper or slates on command. P answering correctly explains at BB to those who were wrong. Who did the same? Who did it another way? etc. Mistakes discussed and corrected.

Solution: e.g.

The sides of a rectangular play area are 54.8 m wide and 23.6 m long. How much fencing is needed to surround the play area if the gate is 1.8 m wide?

BB:

Perimeter: $2 \times (54.8\text{ m} + 23.6\text{ m}) = 2 \times 78.4\text{ m} = \underline{156.8\text{ m}}$

Gate: 1.8 m

Fencing: $156.8\text{ m} - 1.8\text{ m} = \underline{155\text{ m}}$

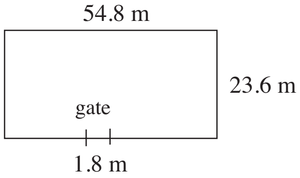
Answer: The length of fencing needed is 155 metres.

Individual work, monitored helped

T might review the steps for solution before Ps start (or if class is not very able, draw the diagram on BB first)

Discussion, reasoning, agreement, self-correction, praising

BB:



$$\begin{array}{r} 54.8 \\ +\,23.6 \\ \hline 78.4 \\ \hline {\scriptstyle 1} \end{array} \qquad \begin{array}{r} 78.4 \\ +\,78.4 \\ \hline 156.8 \\ \hline {\scriptstyle 1} \end{array}$$

35 min

8

Book 4, page 80

Q.4 Read: *Which numbers can be written instead of the letters?*

Deal with one row at a time. Set a time limit. Calculations can be written in *Ex. Bks* if necessary but encourage Ps to do it mentally if they can. Remind Ps to check mentally by inserting their value for the letter in the operation.

Review at BB with whole class. Ps could show answers on scrap paper or slates on command. Ps answering correctly explain to those who were wrong. Mistakes discussed and corrected.

Solution:

a) $a + 3.4 = 5.6$, $a = \underline{2.2}$

b) $b - 3.1 = 0$, $b = \underline{3.1}$

c) $c + 2.7 = 10$, $c = \underline{7.3}$

d) $7.8 + d = 12.3$, $d = \underline{4.5}$

e) $8.2 - e = 6.4$, $e = \underline{1.8}$

f) $f - 1.9 = 6.3$, $f = \underline{18.2}$

g) $g + g + 5.4 = 10$, $g + g = 4.6$, $g = \underline{2.3}$

h) $0.4 + h = 0.8 - h$, $h + h = 0.8 - 0.4 = 0.4$, $h = \underline{0.2}$

i) $\frac{2}{5} + i = 1.3$, $i = 1.3 - 0.4$, $i = \underline{0.9}$

j) $j - 0.8 = 1\frac{5}{10}$, $j = 1.5 + 0.8$, $j = \underline{2.3}$

k) $\frac{3}{4} - k = 0.07$, $0.75 - k = 0.07$, $k = 0.75 - 0.07$, $k = \underline{0.68}$

Individual work, monitored, helped (or g) to f) as whole class activity if class is not very able or time is short)

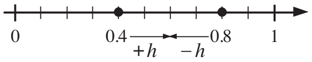
Written on BB or use enlarged copy master or OHP

At a good pace

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

Show on diagrams or on number line drawn on BB if problems.

h) Accept trial and error but show on number line.



i) $\begin{array}{r} 1.3 \\ -\,0.4 \\ \hline 0.9 \\ \hline \end{array}$ k) $\begin{array}{r} 0.75 \\ -\,0.07 \\ \hline 0.68 \\ \hline \end{array}$

45 min

Bk4

R: Mental and written calculation
C: Fractions and decimals in context (length, capacity, mass, etc.)
E: Problems

Lesson Plan 81

Activity

Notes

1

Tables practice

T says a multiplication (up to 10 × 10) or a division. Ps say result.

Ps can say the multiplications or divisions too!

If a P makes a mistake the next P must correct it.

Whole class activity

In order round class or Ps chosen at random

At speed. In good humour!

5 min

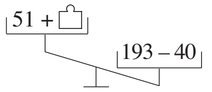
2

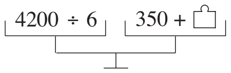
Equations and inequalities

Which whole numbers could be written instead of the shapes?

Ps come to BB to do calculations and list the possible numbers. Class checks that they are correct.

BB:

a) 

b) 

$51 + □ < 193 - 40 = 153$
$□ < 153 - 51 = 102$
$□$: $\underline{101, 100, 99, \dots}$

$4200 \div 6 = 350 + □$
$700 = 350 + □$
$□ = \underline{350}$

c) $5200 - ♡ = (620 + 300) \times 2 = 920 \times 2 = 1840$

$♡ = 5200 - 1840 = \underline{3360}$

d) $(7000 - 2500) \div 9 < ⋈ - 300$
$4500 \div 9 < ⋈ - 300$
$500 < ⋈ - 300$
$500 + 300 < ⋈$
$800 < ⋈$
$⋈$: $\underline{801, 802, 803, \dots}$

Whole class activity

Written on BB or use enlarged copy master or OHP

At a good pace

In a) and b), Ps first write statements about the balances.

Reasoning, agreement, checking, praising

Feedback for T

13 min

3

Missing signs

Which is more? How much more? Ps come to BB to convert one side to the same unit of measure as the other, fill in the missing signs and calcuate the differences, explaining reasoning. Class agrees/ disagrees.

BB:

a) $\overset{(40\text{ cm})}{\frac{2}{5}\text{ m}} \underset{(2\text{ cm})}{\boxed{>}} 38\text{ cm}$

b) $\overset{(700\text{ g})}{0.7\text{ kg}} \underset{(630\text{ g})}{\boxed{>}} 70\text{ g}$

c) $£200\ 50\text{ p} \boxed{=} £200\frac{1}{2}$

d) $\overset{(45\text{ min})}{\frac{3}{4}\text{ hour}} \underset{(30\text{ min})}{\boxed{<}} 75\text{ minutes}$

e) $\overset{(4870\text{ cm})}{48.7\text{ m}} \underset{(63\text{ cm})}{\boxed{>}} \overset{(4807\text{ cm})}{48\text{ m }7\text{ cm}}$

f) $\overset{(2\text{ wks }2\text{ dys})}{2\frac{2}{7}\text{ weeks}} \underset{(1\text{ day})}{\boxed{<}} 2\text{ weeks }3\text{ days}$

Whole class activity

Written on BB or use enlarged copy master or OHP

Ps decide what to do first (i.e. which side to change to which unit) and how to continue.

Discussion, reasoning, agreement, praising

Feedback for T

20 min

Activity | *Notes*

4

Missing quantities

Ps come to BB to choose a column and calculate the missing number, explaining reasoning. (Calculations written at side of BB.) Class agrees/disagrees or suggests alternative ways of writing the amount.

BB:

A	0.9	2508	5 litres 420 ml	457.3	$\frac{1}{5}$	$1\frac{1}{6}$	2 h 43 min
B	$\frac{3}{10}$	8502	2.510 litres	191.8	$\frac{4}{5}$	$3\frac{5}{6}$	3 h 17 min
A + B	**1.2**	**11 010**	**7.930 litres**	**649.1**	**1**	**5**	**6 hours**
or	$\frac{12}{10}$, $1\frac{2}{10}$		7 litres 930 ml 7930 ml		$\frac{5}{5}$	$4\frac{6}{6}$	

25 min

Whole class activity

Drawn on BB or use enlarged copy master or OHP

At a good pace

Bold numbers are missing

Reasoning, agreement, praising

Feedback for T

5

Book 4, page 81

Q.1 Read: *Write a plan, estimate, calculate and check in your exercise book. Write the answer here.*

Deal with one at a time. Set a time limit. Ps read question themselves and solve it in *Ex. Bks*, then write the answer in *Pbs*.

Review with whole class. Ps could show results on scrap paper or slates on command. Ps responding correctly explain at BB to those who were wrong. Mistakes discussed and corrected.

Solution:

a) *Helen spent £8.40, Jane spent £3.90 and Lisa spent £5.20. How much did they spend altogether?*

Plan: 8.40 + 3.90 + 5.20 (£)

E: £8 + £4 + £5 = £17

C:

$$\begin{array}{r} 8.40 \\ 3.90 \\ +\quad 5.20 \\ \hline 17.50 \\ {\scriptstyle 1} \end{array}$$

Answer: They spent £17.50 altogether.

b) *Frank and Barry each dug up 2 fifths of the vegetable plot.*

i) *What part of the vegetable plot did they dig up altogether?*

Plan: F + B: $\frac{2}{5} + \frac{2}{5} = \frac{4}{5}$

Answer: They dug up 4 fifths of the plot altogether.

ii) *What part did they still have to dig?*

Plan: Still to dig: $1 - \frac{4}{5} = \frac{5}{5} - \frac{4}{5} = \frac{1}{5}$

Answer: They still have 1 fifth of the plot to dig.

c) *Polly bought 1.5 kg of apples and 5 tenths of a kg less of bananas.*

i) *How many kg of bananas did she buy?*

Plan: B: 1.5 kg – $\frac{5}{10}$ of 1 kg = 1.5 kg – 0.5 kg = $\underline{\text{1 kg}}$

Answer: Polly bought 1 kg of bananas.

ii) *How much fruit did she buy altogether?*

Plan: A + B: 1.5 kg + 1 kg = $\underline{\text{2.5 kg}}$

Answer: Polly bought 2.5 kg of fruit altogether.

36 min

Individual work, monitored, helped

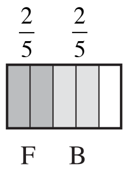
Allow time for majority of Ps to complete it.

(Or T chooses P to explain at BB. Who agrees/disagrees? etc.)

Reasoning, agreement, checking, self-correction, praising

Check by adding in opposite direction or with a calculator.

BB:



or 1500 g – 500 g = 1000 g
= $\underline{\text{1 kg}}$

Activity

Notes

6

Book 4, page 81

Q.2 Read: *Draw a diagram to help you solve the problem.*

Kate wants to cut a 2.4 m length of ribbon into two pieces, so that one piece is twice as long as the other piece.

What will be the length of each piece?

Set a time limit. Ps draw a diagram and solve it in *Pbs*.

Review with whole class. Ps could write both lengths on scrap paper or slates on command. Ps with correct responses explain to Ps who were wrong. Mistakes discussed and corrected.

Solution:

If one piece is twice as long as the other piece, we need to mark the ribbon into 3 equal parts. Each part is 1 third.

BB: e.g.

Shorter piece: $\frac{1}{3}$ of 2.4 m = 240 cm ÷ 3 = 80 cm = $\underline{0.8\text{ m}}$

Longer piece: $\frac{2}{3}$ of 2.4 m = 80 cm × 2 = 160 cm = $\underline{1.6\text{ m}}$

Answer: One piece will be 0.8 m and the other will be 1.6 m.

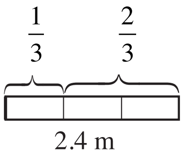
Individual work, monitored, helped

(Or whole class activity, with Ps suggesting what to do and how to continue. T intervenes only if necessary.)

In unison

Reasoning, agreement, self-correction, praising

BB:



Check:

0.8 m + 1.6 m = 2.4 m

40 min

7

Book 4, page 81

Q.3 Read: *Divide up the shapes into 4 congruent parts so that the sum of the numbers in each part is 2.*

What does <u>congruent</u> mean? (exactly the same size and shape)

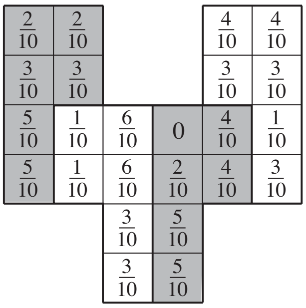
T gives Ps a few minutes to think about the problem, discuss it with their neighbours if they wish, and try out shapes.

Elicit that there are 24 squares in each diagram, so each part will contain 6 squares and will have total value 20 tenths.

Ps come to BB to show their shapes. Class checks the number of squares and tenths.

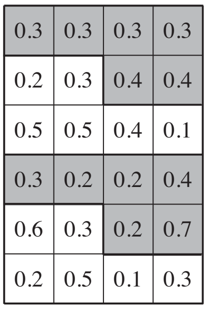
Solution:

a)



$\frac{2}{10}$	$\frac{2}{10}$			$\frac{4}{10}$	$\frac{4}{10}$
$\frac{3}{10}$	$\frac{3}{10}$			$\frac{3}{10}$	$\frac{3}{10}$
$\frac{5}{10}$	$\frac{1}{10}$	$\frac{6}{10}$	0	$\frac{4}{10}$	$\frac{1}{10}$
$\frac{5}{10}$	$\frac{1}{10}$	$\frac{6}{10}$	$\frac{2}{10}$	$\frac{4}{10}$	$\frac{3}{10}$
		$\frac{3}{10}$	$\frac{5}{10}$		
		$\frac{3}{10}$	$\frac{5}{10}$		

b)



0.3	0.3	0.3	0.3
0.2	0.3	0.4	0.4
0.5	0.5	0.4	0.1
0.3	0.2	0.2	0.4
0.6	0.3	0.2	0.7
0.2	0.5	0.1	0.3

Individual or paired work, monitored

(or whole class activity if time is short)

Drawn on BB or use enlarged copy master or OHP

Ps could have spare copies on desks for trials.

BB: 24 ÷ 4 = 6, $2 = \frac{20}{10}$

Discussion, reasoning, agreement, checking, self-correcting, praising

When Ps have checked their shapes, they colour them in their *Pbs* in different colours.

Extension

What can you say about the shape of each <u>part</u>? (e.g. plane shape, hexagon, right angles at vertices, opposite sides parallel, concave, which shapes are reflexions, which are transformations, etc.)

Whole class activity

Praise all positive contributions.

45 min

Bk4

R: Mental calculation with natural numbers

C: Fractions and decimals in context. Measures

E: Problems

Lesson Plan *82*

Activity | *Notes*

1 Mental practice

a) T says an addition or subtraction of whole hundreds or tens. Ps say the sum or difference. (Items could be written on BB too.)

e.g. 2400 + 5300 (= 7700); 6700 – 5100 (= 1700 – 100 = 1600);
480 + 270 (= 680 + 70 = 750);
3500 – 1900 (= 1500 + 100 = 1600); etc.

b) T says a multiplication or division (up to 10 × 10). Ps say result.

c) Extended multiplication and division: e.g. 50 × 3 (= 150);
7 × 800 (= 5600); 40 × 60 (= 2400); 13 × 9 (= 90 + 27 = 117);
8600 ÷ 2 (= 4300); 4400 ÷ 400 (= 11); 480 ÷ 4 (= 120); etc.

Notes:
Whole class activity
At speed in order round class
Ps calculate loudly in steps. Class points out mistakes.
Agreement, correcting, praising
Feedback for T
(or 130 – 13 = 17)

12 min

2 Missing numbers

What do you think the rule for these puzzles could be? (The sum of any two adjacent numbers is the number directly above them.)

Ps come to BB to fill in the missing numbers, explaining reasoning. Class agrees/disagrees.

BB: a)

$2\frac{3}{5}$
$\frac{7}{5}$ | $\frac{6}{5}$
$\mathbf{\frac{3}{5}}$ | $\frac{4}{5}$ | $\mathbf{\frac{2}{5}}$
$\frac{1}{5}$ | $\mathbf{\frac{2}{5}}$ | $\frac{2}{5}$ | **0**

b)

10
4.3 | 5.7
1.4 | 2.9 | **2.8**
0.5 | **0.9** | 2 | **0.8**

Notes:
Whole class activity
Drawn on BB or use enlarged copy master or OHP
Ps decide where to start and how to continue.
Agreement, praising
Bold numbers are given.

20 min

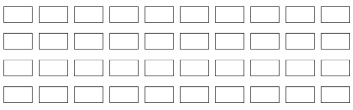
3 Fractions of an amount

Study the diagram. Think of a question involving a fraction which you could ask the class. Ps put up their hands when they have thought of one.

T chooses **A** to ask his/her question. Other Ps write answer on scrap paper or slates and show to **A** on **A**'s command. **A** chooses a P who responded correctly to come to BB to explain, referring to diagram. **A** agrees/disagrees. Repeat for other Ps who have thought of questions.

BB:

a)



e.g. How many rectangles are in:
i) 2 fifths of the diagram?
ii) 3 quarters of the diagram?

b)

How many stars are in
i) 1 third of the digram?
ii) 5 sevenths of the diagram?
etc.

Or, e.g. What part of the diagram are 11 stars? ($\frac{11}{21}$), etc.

Notes:
Whole class activity
Drawn on BB or use enlarged copy master or OHP
(Or T chooses several Ps to ask questions and Ps write answers in *Ex. Bks*. Review at BB with whole class.)

BB:

i) $\frac{2}{5}$ of $40 = \overset{8}{40 \div 5} \times 2 = \underline{16}$

ii) $\frac{3}{4}$ of $40 = \overset{10}{40 \div 4} \times 3 = \underline{30}$

i) $\frac{1}{3}$ of $21 = 21 \div 3 = \underline{7}$

ii) $\frac{5}{7}$ of $21 = \overset{3}{21 \div 7} \times 5 = \underline{15}$

Extra praise for clever questions.

25 min

Bk4

Lesson Plan 82

Activity

4

Book 4, page 82

Q.1 Read: *Write a plan, estimate, calculate and check the result in your exercise book. Write the answer in a sentence here.*

Set a time limit. Ps read questions themselves and solve in *Ex. Bks*, then write the answers in *Pbs*.

Review with whole class. Ps could show results on scrap paper or slates on command. Ps responding correctly explain at BB to those who were wrong. Mistakes discussed and corrected.

Solution:

a) *If I were to give you £6.40, you would have £25.80. How much do you have?*

Plan: £25.80 – £6.40

(or x + £6.40 = £25.80)

E: £26 – £6 = £20

C:

$$\begin{array}{r} 25.80 \\ -\ \ 6.40 \\ \hline 19.40 \\ \hline \end{array}$$

Answer: I have £19.40.

b) *After gathering another 1 and 2 fifths kg of mushrooms, I have 2 and 1 fifth kg of mushrooms altogether. How many kg of mushrooms did I have at first?*

Plan: $2\frac{1}{5}$ kg – $1\frac{2}{5}$ kg *E:* 2 kg – 1 kg = 1 kg

C: $2\frac{1}{5} - 1\frac{2}{5} = \frac{11}{5} - \frac{7}{5} = \frac{4}{5}$ (kg) or

Answer: I had 4 fifths of a kg of mushrooms at first.

c) *What length is the perimeter of this rectangle?*

Plan: P : $(1\frac{1}{4} + 2.5) \times 2$ (cm) *E:* $(1 + 3) \times 2 = 8$ (cm)

Convert the decimal to a fraction: e.g.

P: $(1\frac{1}{4} \times 2) + (2\frac{1}{2} \times 2) = 2\frac{2}{4} + 4\frac{2}{2} = 2\frac{1}{2} + 5 = 7\frac{1}{2}$ (cm)

<u>Or</u> convert the fraction to a decimal: e.g.

P: $(1\frac{1}{4} + 2.5) \times 2 = (1.25 + 2.5) \times 2 = 3.75 \times 2 = 7.50$ (cm)

Answer: The perimeter is 7.5 cm.

35 min

Notes

Individual work, monitored, helped

Allow time for majority of Ps to complete it.

(Or T chooses P to explain at BB. Who agrees/disagrees? etc.)

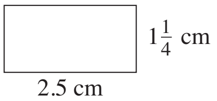
Reasoning, agreement, checking, self-correction, praising

Check against estimate and with mental addition.

(but *E* not very informative)

$2\frac{1}{5} - 1\frac{2}{5} = 1\frac{6}{5} - 1\frac{2}{5} = \frac{4}{5}$

BB:



BB: $2.5 = 2\frac{1}{2}$

$1\frac{1}{4} = 1.25$

C:

$$\begin{array}{r} 2.50 \\ +\ 1.25 \\ \hline 3.75 \\ \hline \end{array} \qquad \begin{array}{r} 3.75 \\ +\ 3.75 \\ \hline 7.50 \\ \hline {\scriptstyle 1\ 1\ \ } \end{array}$$

Bk4

Lesson Plan 82

Activity		*Notes*

5

Book 4, page 82, Q.2

Let's try to solve the problems together.

a) Read: *Divide 20.3 kg into three parts so that the lightest part is half the weight of the middle-sized part and the middle-sized part is half the weight of the heaviest part.*

T gives Ps a minute to think about it and discuss with neighbours if they wish. Into how many equal parts do we need to divide the 20.3 kg? T asks several Ps what they think. (7) We can explain it like this.

Let x be the lightest part. Then:

BB: $x + (x + x) + (x + x + x + x) = 7 \times x = 20.3$ kg

So what part of the 20.3 kg is x? (1 seventh)

Now let's divide it into the 3 parts asked for. Ps dictate what T should write or come to BB, explaining reasoning. Class agrees/disagrees.

<u>Lightest part:</u> $x = 20.3$ kg $\div 7 = 20\,300$ g $\div 7 = 2900$ g $=$ <u>2.9 kg</u>

<u>Middle-sized part</u>: $x + x = 2.9$ kg $+ 2.9$ kg $=$ <u>5.8 kg</u>

<u>Heaviest part</u>: $(x + x) \times 2 = 5.8$ kg $+ 5.8$ kg $=$ <u>11.6 kg</u>

How can we check that we are correct? (The sum of the 3 parts should be 20.3 kg).

b) Read: *Which is more and how much more: 2 thirds of 1200 litres or 4 fifths of 1000 litres? Write it as an inequality.*

Let's write the parts of the inequality we know first. Ps dictate to T. (BB)

What should we do now? (Work out the value of each side.) Ps come to BB or dictate to T, explaining reasoning. Class agrees/disagrees.

BB: LHS: $\frac{2}{3}$ of 1200 litres $= \overset{\text{400 litres}}{\text{1200 litres} \div 3} \times 2 =$ <u>800 litres</u>

BB: RHS: $\frac{4}{5}$ of 1000 litres $= \overset{\text{200 litres}}{\text{1000 litres} \div 5} \times 4 =$ <u>800 litres</u>

What sign should we write in the box? (=)

BB: $\underset{\text{(800 litres)}}{\frac{2}{3} \text{ of 1200 litres}} \; \boxed{=} \; \underset{\text{(800 litres)}}{\frac{4}{5} \text{ of 1000 litres}}$

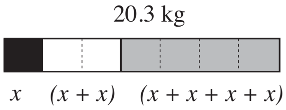
Notes:

Whole class activity

Diagram drawn on BB or SB or OHT

Allow Ps to suggest what to do first, and how to continue. If Ps have no ideas, T gives hints or explains with Ps' help.

BB:



Discussion, reasoning, agreement, checking, praising

Ps write in *Pbs* too.

C:

$$\begin{array}{r|rrrrr} & & 2 & 9 & 0 & 0 \\ \hline 7 & 2 & 0 & 3 & 0 & 0 \\ & & 6 & & & \end{array}$$

$$\begin{array}{rr} & 2.9 \\ + & 2.9 \\ \hline & 5.8 \\ & {\scriptstyle 1} \end{array} \qquad \begin{array}{r} 5.8 \\ + \; 5.8 \\ \hline 11.6 \\ {\scriptstyle 1} \end{array} \qquad \textit{Check:} \; \begin{array}{rr} & 2.9 \\ & 5.8 \\ + & 11.6 \\ \hline & 20.3 \; ✔ \\ & {\scriptstyle 1 \; 2} \end{array}$$

Whole class activity

(or individual work in *Ex. Bks*, monitored, with missing sign shown on scrap paper or 'slates' on command)

Discussion, reasoning, agreement, (self-correcting) praising

(Gradually built up as more information is acquired)

41 min

6

Book 4, page 82, Q.3

Read: *Fill in the missing numbers.*

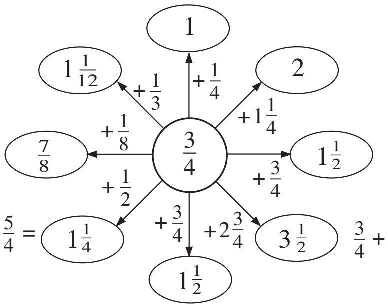
What do you think we have to do in this puzzle? P explains task.

Ps come to BB to choose an arrow, say the addition and write the result. Class agres/disagrees. T might need to help when a conversion is needed.

Solution:

$\frac{3}{4} + \frac{1}{8} = \frac{6}{8} + \frac{1}{8} =$

$\frac{3}{4} + \frac{1}{2} = \frac{3}{4} + \frac{2}{4} = \frac{5}{4} =$



$\frac{3}{4} + \frac{3}{4} = \frac{6}{4} = 1\frac{2}{4} = 1\frac{1}{2}$

$\frac{3}{4} + 2\frac{3}{4} = 2\frac{6}{4} = 3\frac{2}{4} = 3\frac{1}{2}$

Notes:

Whole class activity

(or some items as individual work, monitored, helped)

Drawn on BB or use enlarged copy master or OHP

At a good pace

Reasoning, agreement, (self-correcting), praising

BB:

$$\text{e.g. } \frac{3}{4} + \frac{1}{3} = \frac{9}{12} + \frac{4}{12} = \frac{13}{12} = 1\frac{1}{12}$$

45 min

Bk4

R: Mental calculation with natural numbers
C: Fractions and decimals. Measures
E: Problems

Lesson Plan 83

Activity		***Notes***
1	**Mental addition and subtraction** T says an addition or subtraction. Ps give result. (Ps can answer in steps or just give the final answer.) e.g. 67 + 25 (= 87 + 5 = 92), 420 – 180 (= 320 – 80 = 240), 5200 + 4100 (= 9200 + 100 = 9300); 399 + 401 (= 799 + 1 = 800) or (= 801 – 1 = 800) etc. Ps can think of operations too! *5 min*	Whole class activity T chooses Ps at random. Class points out mistakes. At a good pace. In good humour! Praising, encouragement only
2	**Mental multiplication and division** T says a multiplication or division. Ps give result (in steps if necessary). e.g. 3 × 4 (= 12), 40 ÷ 5 (= 8), 70 × 9 (= 630), 600 ÷ 30 (= 20), 350 × 8 (= 700 × 4 = 2800), 12 × 8 (= 80 + 16 = 96), 40 × 99 (= 4000 – 40 = 3960), 1000÷ 4 (= 500 ÷ 2 = 250), etc. (T writes some of the operations on BB.) Ps can think of operations too! *10 min*	Whole class activity At speed, in order round class Differentiaton by question. Class points out mistakes. At a good pace Praising, encouragement only
3	**Sequences** T says first few terms of a sequence and also writes them on the BB. Ps continue the sequence, coming o BB or dictating to T. Class points out errors. What is the rule we are using? a) 0.1, 0.2, 0.4, (0.8, 1.6, 3.2, 6.4, 12.8, 25.6, 51.2, 102.4, . . .) *Rule*: e.g. Each following term is twice the previous term. [× 2] b) 0.1, 0.3, 0.7, 1.5, (3.1, 6.3, 12.7, 25.5, 51.1, 102.3, . . .) 0.2 0.4 0.8 1.6 3.2 6.4 12.8 25.6 51.2 . . . *Rule*: Difference between terms is increasing by 2 times. Ps might notice the relationship with the sequence in a). e.g. • Difference sequence is the same as sequence a) but starting at 0.2; • The terms in sequence b) are 0.1 less than in sequence a). • T points out: 0.1 in b) = 0.1 in a), 0.3 in b) = 0.1 + 0.2 in a), 0.7 in b) = 0.1 + 0.2 + 0.4 in a), 1.5 in b) = 0.1 + 0.2 + 0.4 + 0.7 in a), etc. c) $25\frac{1}{3}$, $24\frac{2}{3}$, 24, $23\frac{1}{3}$ ($22\frac{2}{3}$, 22, $21\frac{1}{3}$, $20\frac{2}{3}$, 20, $19\frac{1}{3}$, . . .) *Rule*: Terms are decreasing by $\frac{2}{3}$. [$-\frac{2}{3}$] *18 min*	Whole class activity At a good pace Reasoning, agreement, praising (If a P says an unexpected term, ask him/her to explain the rule they are using. Accept any correctly reasoned rule and rerms!) Discussion on the rule. T repeats in a clearer way if necessary. T draws Ps' attention to the two sequences if no P notices anything.
4	**Subtraction practice** Let's fill in the missing numbers. Ps come to BB to write numbers, explaining calculation in detail. Class points out errors. BB: $\begin{array}{r} 3049 \\ -\ 1410 \\ \hline \boxed{\mathbf{1639}} \end{array} \nearrow \begin{array}{r} \boxed{\mathbf{1639}} \\ -\ 210 \\ \hline \boxed{\mathbf{1429}} \end{array} \nearrow \begin{array}{r} \boxed{\mathbf{1429}} \\ -\ 555 \\ \hline \boxed{\mathbf{874}} \end{array} \nearrow \begin{array}{r} \boxed{\mathbf{874}} \\ -\ 873 \\ \hline \boxed{\mathbf{1}} \end{array}$ What do you notice? We could have written it as one subtraction! (3049 – 3048 = 1) *22 min*	Whole class activity Written on BB or use enlarged copy master or OHP At a good pace Reasoning, agreement, praising Feedback for T

Bk4

Lesson Plan 83

Activity

Notes

5

Multiplication and division practice

Let's fill in the missing numbers. Ps come to BB to write numbers, explaining calculation in detail. Class points out errors. Let's check the division! P comes to BB to work through the long division, saying each step loudly and using place values.

BB:

$$\begin{array}{r} 4\,2\,7 \\ \times\ 3 \\ \hline \boxed{1\,2\,8\,1} \end{array} \qquad \begin{array}{r} \boxed{1\,2\,8\,1} \\ \times\ 3 \\ \hline \boxed{3\,8\,4\,3} \end{array} \qquad \begin{array}{r} 4\,2\,7 \\ \boxed{9}\,\big)\,\boxed{3\,8\,4\,3} \\ -3\,6 \\ \hline 2\,4 \\ -1\,8 \\ \hline 6\,3 \\ -6\,3 \\ \hline 0 \end{array}$$

What do you notice? (Multiplying by 3 and again by 3 is the same as multiplying by 9, so dividing by 9 is the reverse operation and you end up with the number you started with.)

Whole class activity

Written on BB or use enlarged copy master or OHP

At a good pace

Reasoning, agreement, praising

Feedback for T

26 min

6

Book 4, page 83

Q.1 Read: *Solve the problems in your exercise book.*
Write the answers here.

Set a time limit. Ps read questions themselves and solve in *Ex. Bks*, then write the answers in *Pbs*.

Review with whole class. Ps could show results on scrap paper or slates on command. Ps responding correctly explain at BB to those who were wrong. Who did the same? Who did it a different way? etc. Mistakes discussed and corrected.

Solution: e.g.

a) *Sarah cut 2 m 10 cm from a 3.3 m piece of lace to trim a cushion. How much lace did she have left?*

Plan: 3.3 m – 2 m 10 cm *E:* 3 m – 2 m = 1 m

C: 3.3 m – 2.1 cm = <u>1.2 m</u>

(or 330 cm – 210 cm = 120 cm = <u>1.2 m</u>)

Answer: Sarah had 1.2 m of lace left.

b) *Jim bought 5 litres of plant food. He used 2 litres 70 cl on his vegetables and 1.2 litres on the other plants in his garden. How much plant food did he have left?*

Plan: 5 litres – (2 litres 70 cl + 1.2 litres)

E: 5 – (3 + 1) = 5 – 4 = 1 (litre)

C: 5 – (2.7 + 1.2) = 5 – 3.9 = <u>1.1</u> (litres),

or 500 cl – (270 cl + 120 cl) = 500 cl – 390 cl = 10 cl

= <u>1.1 litres</u>

Answer: Jim had 1.1 litres left.

Individual work, monitored, helped

Differentiation by time limit

Discussion, reasoning, agreement, self-correcting, praising

Accept any correct way of calculating.

Deal with all methods used.

BB: 2 m 10 cm = 2.1 cm

$$\begin{array}{r} 3\,.\,3 \\ -\ 2\,.\,1 \\ \hline 1\,.\,2 \end{array}$$

BB: 2 litres 70 cl = 2.7 litres

$$\begin{array}{r} 2\,.\,7 \\ +\ 1\,.\,2 \\ \hline 3\,.\,9 \end{array} \qquad \begin{array}{r} 5\,.\,{}^{10}0 \\ -\ 3_1.\,9 \\ \hline 1\,.\,1 \end{array}$$

32 min

Bk4

Lesson Plan 83

Activity

Notes

7

Book 4, page 83

Q.2 Read: *How can the butterfly get to the flower? Calculate the length of the possible routes.*

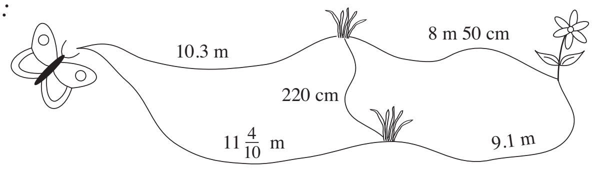
How many routes are possible? (4) You can work out the length of each route in fractions or decimals. Set a time limit.

Review at BB with whole class. Ps come to BB to show their route on the diagram and then to calculate its total length. Class points out errors. Mistakes corrected. Who found another one? etc. Deal with all cases.

Stand up if you found all 4 routes correctly. Lets give them 3 cheers!

Which route would you take if you were the butterfly? Why?

Solution:



1) 10.3 m + 8 m 50 cm = 10.3 m + 8.5 m = <u>18.8 m</u>

2) 10.3 m + 220 cm + 9.1 m = 10.3 m + 2.2 m + 9.1 m = <u>21.6 m</u>

3) $11\frac{4}{10}$ m + 220 cm + 8 m 50 cm = 11.4 + 2.2 + 8.5 (m)

= <u>22.1 m</u>

4) $11\frac{4}{10}$ m + 9.1 m = 11.4 m + 9.1 m = <u>20.5 m</u>

37 min

Individual work, monitored, helped

Drawn on BB or use enlarged copy master or OHP

Discussion, reasoning, agreement, self-correcting, praising

But also praise all Ps who calculated a route correctly!

Ask several Ps. In good humour!

8

Book 4, page 83

Q.3 Read: *Three boys are giving each other clues about their heights. How tall is each boy?*

Ps read the clues themselves and do any necessary calculations in *Ex. Bks*. Heights written in *Pbs*. Set a time limit.

Review at BB with whole class. Ps could show heights on scrap paper or slates on command. Ps answering correctly explain at BB to those who were wrong. Mistakes discussed and corrected.

Solution: e.g.

A: *My height is 2 thirds of 180 cm.*

$\frac{2}{3}$ of 180 cm = 180 cm ÷ 3 × 2 = 60 cm × 2 = <u>120 cm</u>

B: *My height is 8 tenths of 160 cm.*

$\frac{8}{10}$ of 160 cm = 160 cm ÷ 10 × 8 = 16 cm × 8 = <u>128 cm</u>

C: *Three fifths of my height is 72 cm.*

$\frac{3}{5}$ → 72 cm

$\frac{1}{5}$ → 72 cm ÷ 3 = 60 cm ÷ 3 + 12 cm ÷ 3 = 24 cm

$\frac{5}{5}$ → 72 cm ÷ 3 × 5 = 24 cm × 5 = <u>120 cm</u>

41 min

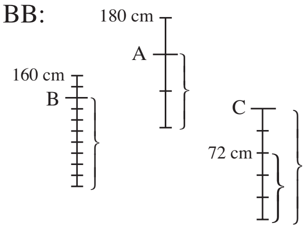
Individual work, monitored, helped

(or whole class activity with 3 boys at front of class to read 'their' clues and explain their heights.)

Reasoning, agreement, self-correcting, praising

Draw diagrams on BB if necessary, e.g.

BB:



Who is taller than whom? Who can write it in a mathematical way?

BB: $A = C < B$

Bk4

Lesson Plan 83

Activity

Notes

9

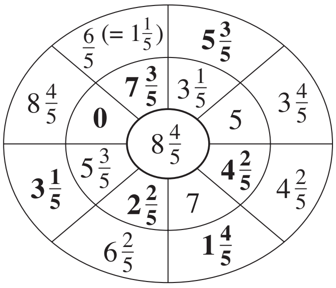
Book 4, page 83

Q.4 Read: *Work out the rule and fill in the missing numbers.*

Elicit the rule with the whole class first. (8 and 4 fifths is the sum of the numbers in the middle and outer rings in the same segement.) Set a time limit.

Review at BB with whole class. Ps come to BB to write missing numbers or T points to a space and Ps dictate the number, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected. Write calculations on BB if problems.

Solution:



Individual work, monitored, helped

(Or whole class activity if time is short)

Drawn on BB or use enlarged copy master or OHP

Reasoning, agreement, self-correcting, praising

Extension

What would the numbers be as decimals?

e.g. $8\frac{4}{5} = 8\frac{8}{10} = 8.8$

$7\frac{3}{5} = 7\frac{6}{10} = 7.6$

etc.

45 min

Bk4

R: Mental and written calculations with natural numbers

C: Fractions and decimals. Measures

E: Problems. Puzzles

Lesson Plan 84

Activity | ***Notes***

1

Mental calculation

a) T says an addition or a subtraction. Ps say the result (in steps if necessary). e.g. 150 + 280 (= 350 + 80 = 430), 4500 – 2900 (= 1500 + 100 = 1600), 137 + 54 (= 187 + 4 = 191), 5403 – 36 (= 5373 – 6 = 5367), etc.

b) Multiplication and division tables relay (up to 10 × 10)

T says a multiplication or division, e.g. 5 × 9, P says result (= 45) and says another multiplication or division to next P, and so on. Class points out errors or duplications.

c) T says a multiplication or division, P says result (in steps if necessary). e.g. 64 ÷ 4 (= 16), 42 × 3 (= 126), 210 ÷ 7 (= 30), 500 × 3 (= 1500) , 81 × 40 (= 324 × 10 = 3240), etc.

Ps can think of operations for a) and c) too!

10 min

Whole class activity

T chooses Ps at random for a) and c), but in order round class for b)

Operations for a) and c) could be written on BB if T thinks it is necessary.

At speed. In good humour!

Agreement, praising

Class points out mistakes.

Write steps of some operations on BB if problems.

2

Mental questions

T asks a question. Ps calculate mentally and show result on slates or scrap paper on command. P responding incorrectly come to BB to write the operation on BB and do the calculation (with help of class).

a) *Which number should we add to 45 to get 80?*

Show me . . . now! (35)

(BB: 80 – 45 = 40 – 5 = $\underline{35}$, or 45 + $\underline{35}$ = 80)

b) *Which number should we subtract from 120 to get 72?*

Show me . . . now! (48)

(BB: 120 – 72 = 50 – 2 = $\underline{48}$, or 120 – $\underline{48}$ = 72)

c) How many 61s are in 183? Show me . . . now! (3)

(BB: 183 ÷ 61 = 3, as $\underline{3}$ × 61 = 183)

15 min

Whole class activity

T repeats the question slowly to give Ps time to think.

(T might allow less able Ps to write the calculation on scrap paper or slates.)

Responses shown in unison.

Reasoning, agreement, praising

BB: 61 + 61 = 122
122 + 61 = 183

3

Mental addition/subtraction of fractions and decimals

Tell me the number which is:

a) $\frac{2}{5}$ more than: $\frac{1}{5}\left(\frac{3}{5}\right)$; $\frac{4}{5}\left(\frac{6}{5} = 1\frac{1}{5}\right)$; $1\frac{3}{5}\left(1\frac{5}{5} = 2\right)$; etc.

b) $\frac{3}{8}$ less than: $\frac{7}{8}\left(\frac{4}{8} = \frac{1}{2}\right)$; $1\left(\frac{5}{8}\right)$; $4\frac{3}{8}$ (4); $2\frac{1}{8}\left(1\frac{6}{8} = 1\frac{3}{4}\right)$; etc.

c) 0.4 more than: 0.3 (0.7); 1.9 (2.3), 4.6 (5). etc.

d) 2.1 less than: 8.9 (6.8); 2.1 (0), 10 (7.9), etc.

Ps can think of questions to ask too.

20 min

Whole class activity

T chooses Ps at random

At speed. In good humour!

Agreement, praising

Class points out errors.

Ps write operation on BB if problems.

Feedback for T

Activity

Notes

4

Book 4, page 84

Q.1 Read: *Change the quantities.*

Elicit that 1 cm = 10 mm and 1 m = 100 cm = 1000 mm (BB)

Let's see how many of these you can do in 3 minutes!
Start . . . now! . . . Stop! Ps sit up with arms folded when finished.

Ps dictate results and T writes on BB (or T has solution already prepared and uncovers each answer as it is dealt with).

Ps mark and correct own (or neighbour's) work. Who had all 8 correct (1 mistake)? Let's give them a pat on the back!

What kind of mistakes did you make? Deal with all cases.

Solution:

a) 40 cm = $\underline{400}$ mm
508 cm = $\underline{5080}$ mm
70 m = $\underline{7000}$ cm
68 m = $\underline{6800}$ cm

b) 30 mm = $\underline{3}$ cm
8060 mm = $\underline{806}$ cm = $\underline{8}$ m $\underline{6}$ cm
7800 cm = $\underline{78}$ m
520 cm = $\underline{5}$ m $\underline{20}$ cm = $\underline{5200}$ mm

Extension How could we write 5200 mm using only metres? (5.2 m)

Individual work, monitored, (helped)

Written on BB or use enlarged copy master or OHP

Differentiation by time limit

Reasoning, agreement, self-correction, praising

25 min

5

Book 4, page 84

Q.2 Read: *Change the quantities.*

Elicit that 1 litre = 100 cl = 1000 ml and 1 kg = 1000 g (BB)

Let's see if you can do better this time! (Quicker or more accurate)
Start . . . now! . . . Stop! Ps put hands on heads when finished.

Ps dictate results and T writes on BB (or uncovers each answer on a prepared solution as it is dealt with).

Ps mark and correct own (or neighbour's) work. Who had all 8 correct or did better than last time? Let's give them a clap!

What kind of mistakes did you make? Deal with all cases.

Solution:

a) 73 litres = $\underline{7300}$ cl
57 cl = $\underline{570}$ ml
6.2 kg = $\underline{6200}$ g
5.8 litres = $\underline{580}$ cl

b) 40 ml = $\underline{4}$ cl
93 ml = $\underline{9}$ cl $\underline{3}$ ml = $\underline{9.3}$ cl
1800 g = $\underline{1}$ kg $\underline{800}$ g = $\underline{1.8}$ kg
450 cl = $\underline{4}$ litres $\underline{50}$ cl = $\underline{4.5}$ litres

Extension How could we write 4 cl using only litres? (0.04 of a litre)

Individual work, monitored, (helped)

Written on BB or use enlarged copy master or OHP

Differentiation by time limit

Reasoning, agreement, self-correction, praising

Ask several Ps what they think. Agreement, praising

30 min

6

Book 4, page 84

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

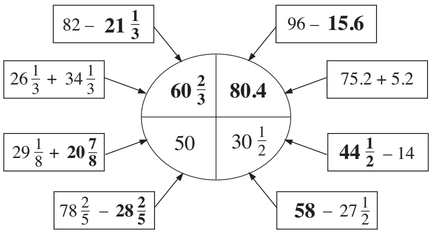
What do you think the arrows show? (Results of the operations)
Set at ime limit. Review at BB with whole class. Ps come to BB or dicate to T, explaining reasoning. Class agrees/disagrees.

Solution:

BB: e.g.

$$82 - 60\frac{2}{3} = 22 - \frac{2}{3}$$

$$= \underline{21\frac{1}{3}}$$



Individual work, monitored, helped

(or whole class activity if time is short)

Drawn on BB or use enlarged copy master or OHP

Initial discussion on the 'rule'

Reasoning, agreement, self-correction, praising

Calculations written in detail on BB if problems.

35 min

Bk4

Lesson Plan 84

Activity

Notes

7

Book 4, page 84, Q.4

Read: *Work out the rule and fill in the missing numbers.*

Ps discuss and agree on the rule. (The difference between any two adjacent numbers is the number directly below them.)

Ps come to BB to choose an appropriate box and fill in the missing number, explaining reasoning. Class agrees/disagrees. (Calculations can be done at side of BB.) Rest of Ps work in *Pbs* too.

Solution:

a)

22.7 | 14.8 | 11.2 | 8.7
7.9 | **3.6** | 2.5
4.3 | **1.1**
3.2

b)

87.9 | 55.5 | 33.3 | 12.1
32.4 | 22.2 | 21.2
10.2 | **1**
9.2

Whole class activity
(or individual work if Ps wish)

Drawn on BB or use enlarged copy master or OHP

At a good pace

Discussion, reasoning, agreement, praising

Extension

T points to each decimal in turn and Ps say it as a fraction, simpified where relevant.

40 min

8

Book 4, page 84

Q.5 Read: *Solve the problem in your exercise book.*

Ps read problem themselves, note the data and do the calculations in their *Ex. Bks*. Set a time limit.

Review with whole class. Ps could show answer on scrap paper or slates on command. Ps answering correctly explain at BB to those who were wrong. Mistakes discussed and corrected.

Solution:

Uncle Jim earned £2400 in February. He spent one fifth of it on food, one sixth on bills and one quarter on his garden.

How much did he have left?

Spent: Food: $\frac{1}{5}$ of £2400 = £2400 ÷ 5 = £480

Bills: $\frac{1}{6}$ of £2400 = £2400 ÷ 6 = £400

Garden: $\frac{1}{4}$ of £2400 = £2400 ÷ 4 = £600

Total: £1480

Had left: £2400 – £1480 = £920.

Answer: Uncle Jim had £920 left.

Individual work, monitored helped

Discussion, reasoning, agreement, self-correction, praising

BB:

$$\begin{array}{r} 480 \\ 5\overline{)\,2400} \\ 4 \end{array}$$

BB:

$$\begin{array}{r} 2400 \\ -\ 1480 \\ \hline 920 \end{array}$$

Extension

Here is another way to solve the problem. Think of £2400 as 1 unit, add all the fractions together and subtract the result from 1.

Ps dictate what T should write. How can we add fifths + sixths + quarters? (Change them to the same denominator.) What is the smallest number which is a multiple of 4, 5 and 6? (60) (T helps.)

If we divided the whole unit into 60 equal parts, what would each part be? (1 sixtieth) Let's show it in a diagram. T draws rectangle and Ps come to BB to colour the appropriate number of squares.

Now let's complete the calculation.

BB: $$1 - \left(\frac{1}{5} + \frac{1}{6} + \frac{1}{4}\right) = 1 - \frac{12 + 10 + 15}{60} = 1 - \frac{37}{60} = \frac{23}{60}$$

$$\frac{23}{60} \text{ of } £2400 = £2400 \div 60 \times 23 = £40 \times 23 = £4 \times 230 = \underline{£920}$$

(= £240 ÷ 6)

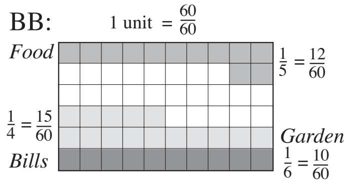
Whole class discussion

BB: 1 unit = £24000

Allow Ps to contribute where they can, otherwise T gives hints or guides or explains.

Agreement, praising

BB:



Agree that 23 sixtieths are left.

45 min

Bk4

R: Calculations, polygons

C: Perimeter, area, volume (with fractions and decimals)

E: Problems

Lesson Plan 85

Activity		*Notes*

1

Sequences

What is a natural number? (A positive whole number) Let's continue these sequences but with certain conditions! T starts and Ps continue.

a) Say 'boom' instead of the natural numbers divisible by 4:

1, 2, 3, boom, 5, (6, 7, boom, 9, 10, 11, boom, . . .)

b) Say 'boom' instead of the multiples of 6:

83, 82, 81, (80, 79, boom, 77, 76, 75, 74, 73, boom, . . .)

c) Say 'boom' instead of the natural numbers:

$\frac{1}{5}$, $\frac{4}{5}$, $1\frac{2}{5}$, boom, $2\frac{3}{5}$, ($3\frac{1}{5}$, $3\frac{4}{5}$, $4\frac{2}{5}$, boom, $5\frac{3}{5}$, . . .)

d) Say 'boom' instead of the natural numbers:

17.6, 16.9, 16.2, 15.5, (14.8, 14.1, 13.4, 12.7, boom, 11.3, . . .)

Whole class activity

At speed in order round class

Agreement on the rule:

a) + 1

b) – 1

c) + $\frac{3}{5}$

d) – 0.7

The terms for c) and d) could be written on BB if necessary.

In good humour!

(Ps could choose a different word to say in each part.)

8 min

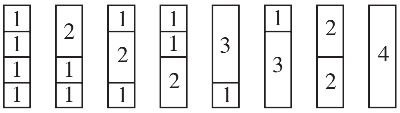
2

Combinatorics

a) How many different ways are there to climb up 4 stairs if you may climb 1, 2, 3, or 4 stairs at a time? Let's show them.

Ps come to BB to demonstrate/draw the different ways (with T's help if necessary). Class agrees/disagrees and points out missed ways.

BB:



→ 8 ways

b) How many different ways are possible if we can climb only 1 or 2 stairs at a time? T asks several Ps what they think and why. (5)

Whole class activity

Discussion, agreement, praising

(If possible, T has set of steps for Ps to demonstrate.)

Or Ps could write on scrap paper or slates and show in unison on command.

13 min

3

Revision of Polygons

T says the name of a plane shape and Ps draw it in *Ex. Bks*. then think of statements to describe their shape. T quickly checks every P's drawing, then chooses Ps to show different versios on BB (or T has diagrams already drawn on BB or OHT and shows them as necessary).

Elicit what Ps know about the shapes, both general and specific. T gives hints if necessary. Elicit the names if Ps know them.

a) Draw a <u>triangle</u>. e.g.

General: It has 3 straight sides, 3 vertices, 3 angles. It is convex. It has no diagonals. *Specific:* Each of its angles is acute (it has a right angle and 2 acute angles or it has an obtuse angle and 2 acute angles)

b) Draw a <u>quadrilateral</u>. e.g.

General: It has 4 straight sides, 4 vertices, 4 angles, 2 diagonals. *Specific*: It is regular (not regular). It has parallel (perpendicular, equal) sides. It is convex (concave). etc.

c) Draw a <u>rectangle</u>. (It is a quadrilateral which has opposite sides parallel and equal. Its adjacent sides are perpendicular. It has two diagonals which are equal and halve each other. It is convex. etc.

d) Draw a <u>square</u>. (Regular rectangle, i.e. its 4 sides are equal in length. Its 2 diagonals cross at right angles. It is convex.)

Extension

Discuss how to name certain angles and sides (using letters). T writes letters on the rectangle and points to a side or an angle. Ps name it.

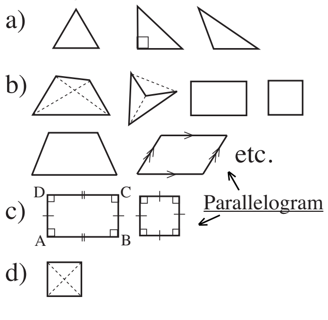
Individual work in drawing diagrams in *Ex. Bks* (or on sheets of squared paper)

Ps should use a ruler..

Whole class discussion on general and specific properties. Praise all positive contributions.

Extra praise for clever statements, (e.g. equilateral, symmetrical, irregular)

BB: e.g.



Ps can use mathematical notation to show some properties.

20 min

Bk4

Lesson Plan 85

Activity

Notes

4

Book 4, page 85

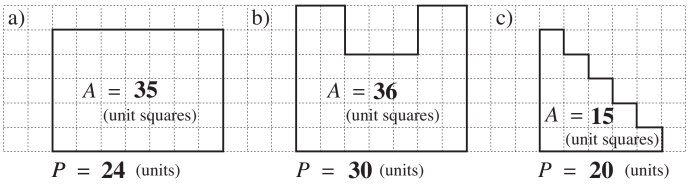
Q.1 Read: *Measure, count or calculate the perimeter of the polygons.*

What is a polygon? (A plane shape with many straight sides.)

Set a time limit. Ps count or calculate the area and perimeter then write them in *Pbs*.

Review at BB with whole class. Ps come to BB to write the values and explain how they found them. Who did the same? Who did it a different way? etc. Mistakes discussed and corrected.

Solution:



By calculation: e.g.

a) $P = (5 + 7) \times 2 = 12 \times 2 = \underline{24}$ (units)

b) $P = 7 + 2 \times 6 + 4 \times 2 + 3 = 7 + 12 + 8 + 3 = \underline{30}$ (units)

c) $P = 4 \times 5 = \underline{20}$ (units)

Extension

What is the name of each polygon? (a) rectangle, b) octagon – 8 sides, c) <u>dodecagon</u> – 12 sides (T tells the name as Ps might not know it.)

Notes:

Individual work, monitored (helped)

Drawn on BB or use enlarged copy master or OHP

Discussion, reasoning, agreement, self-correcting, praising

Reasoning: e.g.

a) $A = 7 \times 5 = \underline{35}$ (sqares)

b) $A = 4 \times 7 + 2 \times 4$
$= 28 + 8 = \underline{36}$ (squares)

Feedback for T

BB: <u>dodecagon</u>

plane shape, 12 straight sides

26 min

5

Book 4, page 85

Q.2 Read: *The sides of a triangular lake are 2400 m, 1350 m and 2130 m long. What is the length of its perimeter?*

Ps write a plan in *Pbs*, estimate the result and do the calculation in *Ex. Bks*, then write the answer as a sentence in *Pbs*.

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

Solution:

Plan: $P = 2400 \text{ m} + 1350 \text{ m} + 2130 \text{ m}$

E: $P \approx 2000 + 1000 + 2000 = 5000$ (m)

C:

	2	4	0	0
	1	3	5	0
+	2	1	3	0
	5	8	8	0

Answer: The perimeter of the lake is 5880 m.

Extension

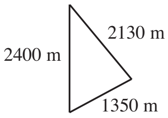
What distance is the perimeter of the lake in km? (5.88 km)

Notes:

Individual work, monitored (helped)

Drawn on BB or SB or OHT

BB:



Discussion, reasoning, agreement, self-correcting, praising

Check against estimate and by adding in both directions.

Ps show where the decimal points would be on the addition.

30 min

Activity		*Notes*

6

Book 4, page 85

Q.3 Read: *Write a plan, estimate, calculate and write the answer.*

Deal with one part at a time. Set a time limit.

Review at BB with whole class. Ps come to BB to show solution, explaining reasoning. Who agrees? Who did it another way? etc. Mistakes discussed and corrected. Draw diagrams on BB.

Solution:

a) *A practice book is 29.7 cm long and 20.8 cm wide. How long is its perimeter?*

Plan: $P = (29.7 + 20.8) \times 2$ (cm)

E: $P \approx (30 + 21) \times 2 = 51 \times 2 = 102$ (cm)

$$C: \quad \begin{array}{r} 2\,9.7 \\ +\ 2\,0.8 \\ \hline 5\,0.5 \\ {\scriptstyle 1\ \ 1\ \ } \end{array} \qquad \begin{array}{r} 5\,0.5 \\ +\ 5\,0.5 \\ \hline 1\,0\,1.0 \\ {\scriptstyle 1\ \ \ \ } \end{array} \ \text{(cm)}$$

Answer: Its perimeter is 101 cm long.

b) *George's room is four and two fifths metres long and three and a half metres wide. How long is its perimeter?*

Plan: $(4\frac{2}{5} + 3\frac{1}{2}) \times 2$ (m)

E: $(4 + 4) \times 2 = 8 \times 2 = 16$ (m)

$$C: (4\frac{2}{5} + 3\frac{1}{2}) \times 2 = (4\frac{4}{10} + 3\frac{5}{10}) \times 2 = 7\frac{9}{10} \times 2$$

$$= 14 + \frac{18}{10} = 15\frac{8}{10} = \underline{15\frac{4}{5}} \text{ (m)}$$

Or $(4\frac{2}{5} + 3\frac{1}{2}) \times 2 = (4.4 + 3.5) \times 2 = 7.9 \times 2 = \underline{15.8}$ (m)

or $(440 + 350) \times 2 = 790 \times 2 = \underline{1580\ (}$ cm) $= \underline{15.8\text{ m}}$

Answer: The length of its perimeter is 15.8 m.

Extension

What is the <u>area</u> of George's room? Ps suggest how to do it with T's help where necessary. Draw grid lines on diagram to show the metre squares, then discuss what the fraction in the bottom right corner is. T explains (with Ps' help).

BB: 1 metre = 10 cm,
so 1 metre square = 10 cm × 10 cm = 100 cm squares

Length: 0.4 of 10 cm = 4 tenths of 10 cm = 4 cm

Width: 0.5 of 10 cm = 5 tenths of 10 cm = 5 cm

Area of small rectangle = 4 cm × 5 cm = 20 cm squares

$$= \frac{20}{100} \text{ m square} = 0.2 \text{ m}^2$$

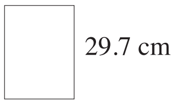
$$A = 4 \times 3 + (0.4 + 0.4 + 0.4) + (0.5 + 0.5 + 0.5 + 0.5) + \underline{0.2}$$
$$= 12 + 1.2 + 2.0 + 0.2 = \underline{15.4} \text{ (metre squares)} = 15.4 \text{ m}^2$$

37 min

Individual work, monitored, helped

Discussion, reasoning, agreement, self-correction, praising

BB:

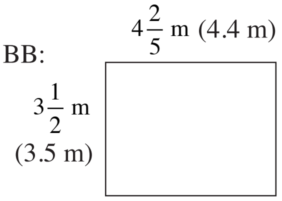


20.8 cm

Elicit its length in metres too.

BB: 101 cm = 1 m 1 cm
= <u>1.01 m</u>

BB:

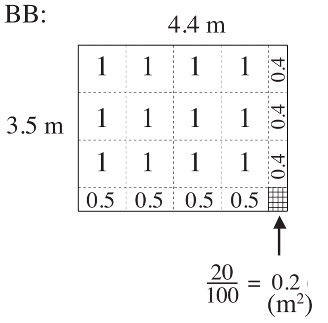


T (or P) could show the addition as a multiplication too.

$$\text{BB:} \quad \begin{array}{r} 7.9 \\ +\ 7.9 \\ \hline 1\,5.8 \\ {\scriptstyle 1\ \ \ \ } \end{array} \ \text{or} \ \begin{array}{r} 7.9 \\ \hline 1.8 \\ 1\,4.0 \\ \hline 1\,5.8 \end{array} \times 2$$

Whole class discussion.

BB:



T (or a P) reminds class how to write 'metre squares' using mathematical notation.

Activity

Notes

7

Book 4, page 85

Q.4 Read: *Calculate the area and the perimeter of this rectangle.*

Ps may use any method they like (including drawing the rectangle accurately on 1 mm grids if they wish).

Set a time limit. Review with whole class. Ps could show results on scrap paper or slates on command. Ps answering correctly explain at BB to those who were wrong. Who agrees? Who did it another way? etc. Mistakes discussed and corrected.

Solution:

P = (0.9 cm + 2.4 cm) × 2 = 3.3 cm × 2 = $\underline{6.6 \text{ cm}}$ or

P = (9 mm + 24 mm) × 2 = 33 mm × 2 = $\underline{66 \text{ mm}}$

A = 0.9 cm × 2.4 cm = 9 mm × 24 mm

= (180 + 36) = 216 (mm squares)

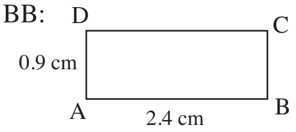
(= 216 mm^2 = 2.16 cm^2)

Individual work, monitored, helped

Ps have 1 mm grids on desks.

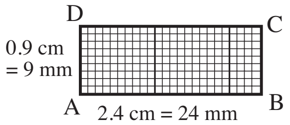
Digrams drawn on BB.

BB:



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

BB: 1 cm^2 = 100 m^2



Extension

Who can think of questions to ask about the rectangle? e.g.

Which side is parallel to AB? (DC)

Which side is equal to AD? (BC)

Which side is perpendicular to AB? (AD and BC)

What are the names of its diagonals? (AC and BD)

Which angle is a right angle? (angle DAB, angle ABC, angle BCD, angle ADC)

Whole class activity

T could start and Ps continue.

T (P) chooses Ps to answer.

Practice in using letters to identify sides and angles in shapes.

Praising, encouragement only

41 min

8

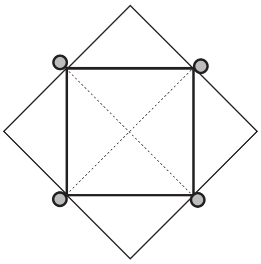
Book 4, page 85, Q.5

Read: *How can the fishing lake be enlarged to twice its area without moving the 4 oak trees?*

How can we do it? Ps discuss it with their neighbours for a minute and then make suggestions. If no P has a good idea, T might give a hint about drawing the diagonals. Elicit that the square has 4 congruent triangles, so an enlargement to twice its size will need 8 congruent triangles.

T could have 2 congruent squares, one stuck to the BB, the other folded along both diagonals and the triangles formed cut out and stuck on the sides of the original square as shown. (This should all be done with help of Ps.)

Solution:



Whole class activity

(or individual or paired trial first if Ps wish)

Ps could have 2 congruent squares on desks too.

Discussion, reasoning, agreement, demonstration, praising

BB:

<u>Square</u>: A = $\underline{4}$ unit triangles

<u>Enlargement</u>::

A = 4 × 2 = $\underline{8}$ (unit triangles)

45 min

Bk4

R: Calculations
C: Natural numbers, fractions and decimals
E: Problems

Lesson Plan 86

Activity		*Notes*

1

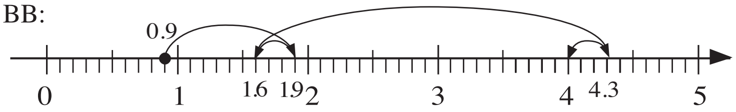
Mental practice

a) Listen carefuly and try to do the calculations in your head. Nod your head when you have done each step and show me the final result when I say.

Start with 0.9, add 1 (1.9) . . . subtract 0.3 (1.6) . . . add 2.7 (4.3), . . . and subtract 0.3.

Show me that result . . . now! (4) Let's show the steps on the number line. Ps come to BB to demonstrate the jumps as T reads them again.

BB:



b) I thought of a number. If I add 5 eighths to it the result will be 2. What was the number I first thought of?

Show me . . . now! (Accept $\frac{11}{8}$ or $1\frac{3}{8}$)

Ps who answered correctly come to BB to explain their reasoning. Class agrees/disagrees. Mistakes discussed. e.g.

BB: $\square + \frac{5}{8} = 2$, so $\square = 2 - \frac{5}{8} = \frac{16}{8} - \frac{5}{8} = \frac{11}{8} = 1\frac{3}{8}$

Notes:

Whole class activity but individual calculations

Less able Ps can note the results of each step in *Ex. Bks*. or on slates.

Give Ps time to calculate.

In unison

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

Agreement, praising

In unison

Reasoning, agreement, praising

or $2 - \frac{5}{8} = 1\frac{8}{8} - \frac{5}{8} = 1\frac{3}{8}$

8 min

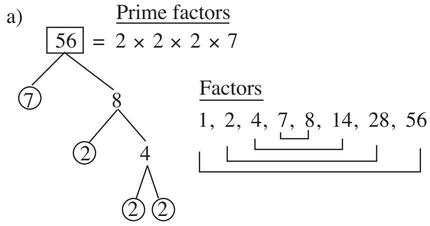
2

Factorisation

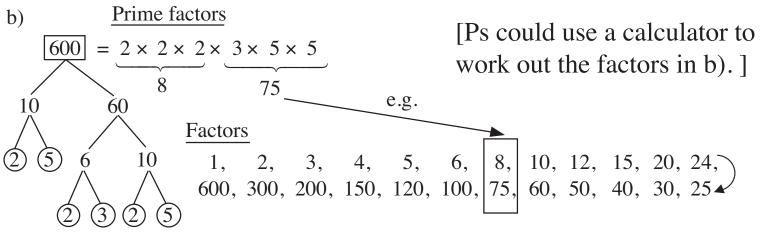
Let's factorise these numbers and write them as a product of their prime factors. Then we will use them to list all the factors in order.

Ps come to BB to draw the factor trees (with help of class if necessary), to write the products and to list the factors in pairs.

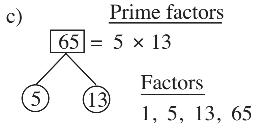
BB:

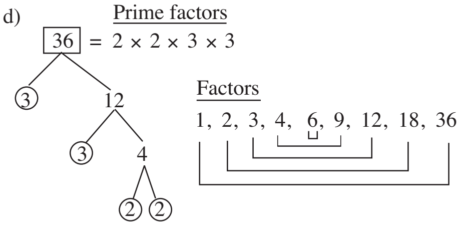


[Elicit that 1 is not a prime number as it has only one factor, itself]



[Ps could use a calculator to work out the factors in b).]





Notes:

Whole class activity

First elicit the meaning of a factor and a prime factor, e.g.

'A factor of a number divides into that number exactly.'

'A prime factor is a factor which is a prime number.

'A prime number has only two factors, itself and 1'

Ps not at BB could draw the factor trees in *Ex. Bks*. or on slates.

At a good pace

Reasoning, correcting, agreement, praising

Note for Ts only

To find how many factors a number has, add 1 to the power of each of its prime factors, then calculate the product. e.g.

56 $= 2^3 \times 7^1$;
$(3 + 1) \times (1 + 1) = 4 \times 2 = \underline{8}$
So 56 has 8 factors.

600 $= 2^3 \times 3^1 \times 5^2$;
$(3 + 1) \times (1 + 1) \times (2 + 1)$
$= 4 \times 2 \times 3 = \underline{24}$ (factors)

20 min

Bk4

Lesson Plan 86

Activity

Notes

3

Book 4, page 86

Q.1 Read: *The unit of area is 1 cm^2. The unit of length is 1 cm. Continue the sequence and complete the table. Write the rule in different ways.*

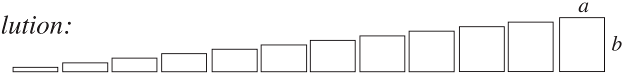
What do you think each row in the table means? What have the rectangles to do with the table? Ask several Ps what they think. T repeats their explanations more clearly and concisely if necessary. If no P knows, T gives hints or explains the task.

(a is the width and b is the height, in cm, of the rectangle at the top of each column. P is its perimeter (in cm) and A is its area (in cm^2). Do one column with whole class first if necessary.

Set a time limit. Ps continue the sequence of numbers in b, complete the rows for P and A, draw the missing rectangles accurately and write the rule in different ways.

Review at BB with whole class. Ps come to BB or dictate to T, explaining reasoning. Class agrees/disagrees. Mistakes discussed and corrected. Elicit the units of measure for each row in the table. Ps label the sides of the final rectangle.

Solution:



a	1	1	1	1	1	1	1	1	1	1	1	1	(cm)
b	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	**1**	**1.1**	**1.2**	(cm)
P	2.2	2.4	**2.6**	**2.8**	**3**	**3.2**	**3.4**	**3.6**	**3.8**	**4**	**4.2**	**4.4**	(cm)
A	0.1	0.2	**0.3**	**0.4**	**0.5**	**0.6**	**0.7**	**0.8**	**0.9**	**1**	**1.1**	**1.2**	(cm^2)

Whole class discussion to start, then individual work, monitored, helped

Ps have rulers on desks for measuring and drawing.

Table drawn on BB or use enlarged copy master or OHP for demonstration only!

Extra praise if Ps notice that b is increasing by 0.1 cm each time

Differentiation by time limit or do one step at a time if Ps are not very able.

Discussion, reasoning, agreement, self-correcting, praising

BB:

Rule:

$P = 2 \times (a + b)$

$a = P \div 2 - b$

$b = P \div 2 - a$

$A = a \times b$

28 min

4

Book 4, page 86, Q.2

Read: *Ten pupils measured their heights and wrote them down in various ways.*

Look carefully at their heights. What is wrong with them? (They use different units and some are written as decimals, some as fractions.) What should we do first? (Change them all to the same unit and form.) Agree on the unit (cm, as used in the table) and the form.

a) Read: S*how the data in this tally chart.*

T chooses 10 Ps to be A, B, etc. and they come to BB to convert their heights to cm and draw a tally mark in the correct place in the tally chart. Class points out errors.

BB: A = 130 cm, B = 135 cm, C = 134 cm, D = 135 cm,
E = 134 cm, F = 134 cm, G = 140 cm, H = 136 cm,
I = 140 cm, J = 134 cm

130	131	132	133	134	135	136	137	138	139	140	cm
|				||||	||	|				||	

b) Read: W*rite the data in decreasing order.*

Class dictates what T should write.

BB: 140 cm, 140 cm, 136 cm, 135 cm, 134 cm, 134 cm, 134 cm, 134 cm, 130 cm

c) Read: *Which height is the most frequent? This is the* *mode*.

Show me . . . now! (134 cm) Agree that it has the most tally marks.

Whole class activity

(or some items as individual work if Ps wish)

Drawn on BB or use enlarged copy master or OHP

Discussion, agreement

T could choose Ps with names which match the letters.

(N.B. The first tally mark has already been made in *Pbs*.)

At a good pace

Reasoning loudly to class
Agreement, praising

Ps complete table in *Pbs* too.

Ps write in *Pbs* too.

Responses shown on scrap paper or slates in unison.

Bk4

Lesson Plan 86

Activity

Notes

4

(Continued)

d) Read: *Which are the middle data?*

Show me . . . now! (134 cm and 135 cm)

If a P responds with 135.5 cm, ask him or her to explain their thinking. Otherwise agree that the number of data items is even, so there is no middle height in the set of data. What should we do? (Find the height which is halfway between 134 cm and 135 cm) Elicit that the middle number is <u>134.5 cm</u> by referring to a number line drawn on BB or a height chart.

We call the middle value in a set of data the <u>median</u> and this is how we calculate it if the number of values in the set is even.

BB: <u>median</u>:

$$\begin{aligned}(134\text{ cm} + 135\text{ cm}) \div 2 &= 269\text{ cm} \div 2\\ &= 134\text{ cm} + 1\text{ cm} \div 2\\ &= 134\text{ cm} + \frac{1}{2}\text{ cm}\\ &= \underline{134.5\text{ cm}}\end{aligned}$$

What is the <u>median</u> of this set of data?

BB: i) 11, 11, 12, 13, 14 (12, as odd number of values)

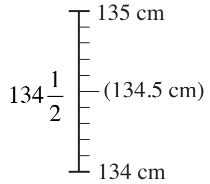
ii) 10, 11, 12, 13, 15, 15 (12.5, as even number of values)

What is the <u>mode</u>? i) 11; ii) 15

In unison

Discussion, reasoning, agreement, praising

BB:



T starts the calculation and Ps continue it.

Ps shout out in unison.

Agreement, praising

Feedback for T

33 min

5

Book 4, page 86

Q.3 Let's see how many of these you can do in 4 minutes! Stand up when you have finished! Start . . . now! . . . Stop!

Review at BB with whole class. Ps dictate results, giving details of reasoning where needed. Ps mark and correct own (or neighbour's) work. Who made a mistake? What kind of mistake? etc.

Stand up if you had them all correct. Let's give them a clap!

Solution:

a)

$$\begin{array}{cccc} & 4 & 1 & 7 \\ + & & 6 & 6 \\ \hline & 4 & 8 & 3 \\ & & {\scriptstyle 1} & \end{array} \qquad \begin{array}{ccccc} & & 3 & 8 & 1 \\ + & 4 & 2 & 0 & 6 \\ \hline & 4 & 5 & 8 & 7 \end{array} \qquad \begin{array}{cccc} & 8 & 3 & 9 \\ - & 5 & 0 & 4 \\ \hline & 3 & 3 & 5 \end{array} \qquad \begin{array}{ccccc} & 6 & 0 & 9 & 2 \\ - & & & 5 & 2 \\ \hline & 6 & 0 & 4 & 0 \end{array} \qquad \begin{array}{ccccc} & 2 & 3 & 4 & 5 \\ + & 7 & 6 & 5 & 4 \\ \hline & 9 & 9 & 9 & 9 \end{array}$$

b)

$$\begin{array}{cccc} & & 7 & 8 \\ + & 2 & 0 & 6 \\ \hline & 2 & 8 & 4 \\ & & {\scriptstyle 1} & \end{array} \qquad \begin{array}{ccccc} & 5 & 2 & 9 & 3 \\ + & & 7 & 5 & 4 \\ \hline & 6 & 0 & 4 & 7 \\ & {\scriptstyle 1} & {\scriptstyle 1} & & \end{array} \qquad \begin{array}{cccc} & 6 & 4 & {}^{10}3 \\ - & 2 & 0_1 & 8 \\ \hline & 4 & 3 & 5 \end{array} \qquad \begin{array}{ccccc} & 5 & {}^{10}0 & 8 & {}^{10}2 \\ - & {}_1 & 4 & 3_1 & 5 \\ \hline & 4 & 6 & 4 & 7 \end{array} \qquad \begin{array}{ccccc} & 7 & {}^{10}8 & {}^{10}3 & {}^{10}4 \\ - & 1_1 & 8_1 & 5_1 & 6 \\ \hline & 5 & 9 & 7 & 8 \end{array}$$

Individual work, monitored

Written on BB or use enlarged copy master or OHP

Differentiation by time limit. T notes Ps who are quickest.

Agreement, self-correcting, evaluating, praising

Special praise for quickest, most accurate P.

Feedback for T

39 min

6

Book 4, page 86

Q.4 Let's see if you can be more accurate and quicker this time! Start . . . now! . . . Stop!

Review at BB with whole class as in a). Class applauds the most improved score or time.

Solution:

a)

$$\begin{array}{ccccc} 2 & 1 & 3 & \times & 3 \\ \hline 6 & 3 & 9 & & \end{array} \qquad \begin{array}{cccccc} 2 & 0 & 2 & 1 & \times & 4 \\ \hline 8 & 0 & 8 & 4 & & \end{array} \qquad \begin{array}{cccc} & 3 & 6 & 4 \\ & & \times & 7 \\ \hline 2 & 5 & 4 & 8 \\ & {\scriptstyle 4} & {\scriptstyle 2} & \end{array} \qquad \begin{array}{cccc} & 5 & 5 & 5 \\ & & \times & 6 \\ \hline 3 & 3 & 3 & 0 \\ & {\scriptstyle 3} & {\scriptstyle 3} & \end{array}$$

b)

$$\begin{array}{cccc} & 2 & 1 & 2 \\ \cline{2-4} \multicolumn{1}{c|}{4} & 8 & 4 & 8 \end{array} \qquad \begin{array}{ccccc} & 3 & 0 & 1 & 2 \\ \cline{2-5} \multicolumn{1}{c|}{3} & 9 & 0 & 3 & 6 \end{array} \qquad \begin{array}{ccccc} & & 6 & 0 & 7 \\ \cline{2-5} \multicolumn{1}{c|}{6} & 3 & 6 & 4 & 2 \\ & & & {\scriptstyle 4} & \end{array} \qquad \begin{array}{ccccl} & 1 & 2 & 6 & \text{r } 6 \\ \cline{2-4} \multicolumn{1}{c|}{7} & 8 & 8 & 8 & \\ & {\scriptstyle 1} & {\scriptstyle 4} & \text{⑥} & \end{array}$$

Individual work, monitored

Written on BB or use enlarged copy master or OHP

Differentiation by time limit.

Reasoning, agreement, self-correcting, evaluating, praising

Show as long multiplication or division if problems.

Feedback for T

45 min

Bk4

R: Calculations

C: Natural numbers, fractions and decimals

E: Problems

Lesson Plan 87

Activity | *Notes*

1 Secret shape

Ps have shape card sets on desks: (circle, triangle, square, pentagon, hexagon), small or large, black or white, with or without a centre dot.

a) How many elements are in the set? (5 × 2 × 2 × 2 = <u>40</u>)

b) I will choose a shape and hide it behind my back. You must ask me questions to find out what it is but I can answer only yes or no. As soon as you know the shape, stand up and show me it.

e.g. T hides the small, white, dotted, hexagon.

Ps: Is it large? (No); Does it have a centre dot? (Yes);
Is it black? (No); Is it a polygon? (Yes); Does it have more than 4 sides? (Yes); Is it a pentagon? (No)

P(s) holds up  You are very clever!

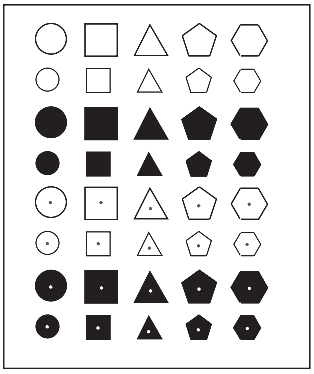
P who is first to answer correctly hides the next shape.

Extension If I put a complete set of shapes in a box and took one out with my eyes closed, what is the probability (chance) that it will be a small, black triangle without a centre dot? (a triangle? black? etc.)

6 min

Whole class activity

Encourage Ps to lay out the cards logically on desks, e.g.



Ask several Ps what they think.

($\frac{1}{40}$; $\frac{8}{40} = \frac{1}{5}$; $\frac{20}{40} = \frac{1}{2}$; etc.)

2 Secret number

I am thinking of a natural number not greater than 10 000. You must ask me questions to find out what it is but you cannot ask the same question as the previous one. I can answer only yes or no.

T (or Ps) could keep a running note of possible numbers on BB too.

e.g. <u>3271</u>

Is it less than 5000? (Yes) Is it more than 2500? (Yes); Does it have an odd digit in the thousands column? (Yes); Is it more than or equal to 3500? (No); Does it have an even digit in the hundreds column? (Yes); Is it more than or equal to 3400? (No); Is it more than 3250? (Yes); Does it have an even digit in the tens column? (No); Is it less than 3270? (No); Is it more than 3275? (No); Does it have an odd number in the units column? (Yes); Is its units digit 3? (No);

It is 3271! (Yes)

P who answered correctly thinks of his/her own number and answers questions about it (with T's help where necessary).

12 min

Whole class activity

Encourage Ps to ask logical questions and to keep in mind the clues already given.

Ps may write clues in *Ex. Bks*. and keep a note of possible numbers, eliminating numbers as more clues are given.

<u>Or</u> Ps ask the <u>same</u> type of question each time, e.g.

Is it more than 5000? (Yes)
Is it more than 2500? (Yes)
Is it more than 3750? (No), etc. etc.

Praising, encouragement only

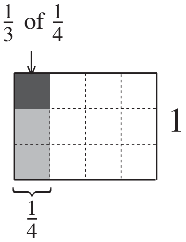
Extra praise for clever questions!

3 Modelling fractions

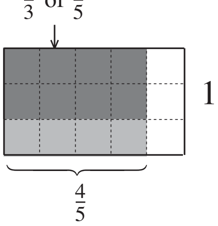
Let's see if you are clever enough to find these parts of a whole.
How could we show it? Ps make suggestions (e.g. draw a diagram, or show with coloured multi-link cubes). Class agrees on number of parts each whole must be divided into (i.e. the smallest multiple of both denominators). Ps come to front of class to show the model and explain their reasoning. Class agrees/disagrees.

e.g.

BB: a) $\frac{1}{3}$ of $\frac{1}{4}$ is $\boxed{\frac{1}{12}}$



b) $\frac{2}{3}$ of $\frac{4}{5}$ is $\boxed{\frac{8}{15}}$



18 min

Whole class activity

Allow Ps to suggest what to do.

T helps (hints) only if necessary.

Discussion, reasoning, agreement, praising

Extra praise if Ps notice that the numerator (denominator) of the final fraction is the <u>product</u> of the numerators (denominators) of the other two fractions, but do not enforce it at this stage.

Activity

Notes

4

Number sets

T has some numbers written on the BB. Let's put them in the correct place in this Venn diagram. First elicit (or explain if Ps do not know) the meaning of the label on each set.

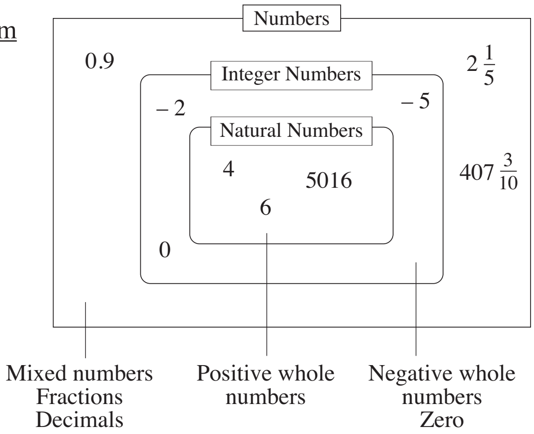
- Numbers means all numbers,
- Integer Numbers means all whole numbers (positive and negative)
- Natural numbers means all positive, whole numbers.

Ps come to BB to choose a number, point to where they think it should go and say why. Class agrees/disagrees. Elicit that in the case of, e.g. (1.3 + 2.7), Ps should work out its value first (i.e. 4) then decide in which set to write the number.

BB:

$$0.9,\ \overset{(4)}{1.3 + 2.7},\ -2,\ 0,\ 5016,\ \overset{(6)}{7\frac{3}{4} - 1\frac{3}{4}},\ 4 - 9,\ \overset{\left(2\frac{1}{5}\right)}{2 + \frac{1}{5}},\ \overset{\left(407\frac{3}{10}\right)}{408 - \frac{7}{10}}$$

Venn diagram



25 min

Whole class activity

Drawn on BB or use enlarged copy master or OHP

Discussion/revision of the classification of numbers

At a good pace

Reasoning, agreement, praising

Agree that all natural numbers, all negative whole numbers and zero are integers.

If there is time, Ps can think of other numbers to add to the diagram.

Feedback for T

5

Book 4, page 87

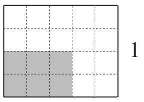
Q.1 Read: *Write true statements about each diagram in your Ex Bk.*

Do part a) with the whole class first if Ps are unsure what to do, or elicit just one example of a possible statement for a).

Set a time limit. Review at BB with whole class. Ps dictate to T who writes statements on BB. Class points out errors or suggests missed statements. Deal with all cases. T helps with missing types.

Solution: e.g. Part *shaded* is:

a)



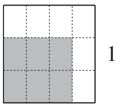
$\frac{6}{20} = \frac{3}{10}$,

$1 - \frac{14}{20} = \frac{6}{20} = \frac{3}{10}$,

$\frac{1}{2}$ of $\frac{3}{5} = \frac{3}{10}$,

$\frac{3}{5}$ of $\frac{2}{4} = \frac{6}{20} = \frac{3}{10}$,

b)



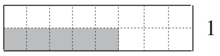
$\frac{6}{12} = \frac{1}{2}$,

$1 - \frac{6}{12} = \frac{6}{12} = \frac{1}{2}$,

$\frac{2}{3}$ of $\frac{3}{4} = \frac{6}{12} = \frac{1}{2}$,

$\frac{3}{4}$ of $\frac{2}{3} = \frac{6}{12} = \frac{1}{2}$,

c)



$\frac{5}{16}$,

$1 - \frac{11}{16} = \frac{5}{16}$,

$\frac{1}{2}$ of $\frac{5}{8} = \frac{5}{16}$,

$\frac{5}{8}$ of $\frac{1}{2} = \frac{5}{16}$

30 min

Individual work, monitored, helped

(or whole class activity if class is not very able)

Drawn on BB or use enlarged copy master or OHP

Agreement, self-correcting, praising

Make sure that Ps understand that, e.g.

$\frac{2}{3}$ of $\frac{3}{4}$ = $\frac{3}{4}$ of $\frac{2}{3}$

by referring to the diagram.

Reiterate that multiplying (dividing) the numerator and denominator of a fraction by the same amount does not change its value.

Accept statements about the *unshaded* parts too!

Bk4

Lesson Plan 87

Activity

Notes

6

Book 4, page 87

Q.2 Read: *Fill in the missing numbers.*

Who can explain what we have to do? (The result of each operation is the number at the top of the column.)

Let's see if you can finish it in 3 minutes! Start . . . now! . . . Stop!

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

Solution:

a) 9000	b) 12	c) 16
$4000 + \boxed{5000}$	$5.6 + \boxed{6.4}$	$8 \times \boxed{2}$
$3900 + \boxed{5100}$	$12 + \boxed{0}$	$4 \times \boxed{4}$
$\boxed{8150} + 850$	$3\frac{1}{5} + \boxed{8\frac{4}{5}}$	$\boxed{16} \times 1$
$\boxed{8933} + 67$	$\boxed{\frac{1}{3}} + 11\frac{2}{3}$	$\boxed{48} \div 3$
$1 + \boxed{8999}$		$0.5 \times \boxed{32}$

Extension Ps think of other ways to describe 9000 (12, 16).

35 min

Individual work, monitored, helped

Written on BB or use enlarged copy master or OHP

Differentiation by time limit

Discussion, reasoning, agreement, self-correction, praising

Write details of calculation on BB if there are problems.

Feedback for T

Orally round class at speed

Extra praise for creativity!

7

Book 4, page 87

Q.3 Read: *Flll in the next nearest tens, units and tenths.*

Set a time limit. T writes additional part d) on BB for the more able Ps if they finish quickly.

Review at BB with whole class. Ps come to BB or dictate to T, saying the whole inequality. Class agrees/disagrees. Mistakes discussed and corrected. If disagreement or difficulty, show on relevant segment of the number line drawn on BB.

Solution:

a) **tens**	b) **units**	c) **tenths**
$\boxed{5410} < 5420 < \boxed{5430}$	$\boxed{5419} < 5420 < \boxed{5421}$	$\boxed{5419.9} < 5420 < \boxed{5420.1}$
$\boxed{650} < 657 < \boxed{660}$	$\boxed{656} < 657 < \boxed{658}$	$\boxed{656.9} < 657 < \boxed{657.1}$
$\boxed{40} < 43.2 < \boxed{50}$	$\boxed{43} < 43.2 < \boxed{44}$	$\boxed{43.1} < 43.2 < \boxed{43.3}$
$\boxed{100} < 103\frac{7}{8} < \boxed{110}$	$\boxed{103} < 103\frac{7}{8} < \boxed{104}$	$\boxed{2.9} < 2.93 < \boxed{3.0}$

d) **hundredths**

$\boxed{5419.99} < 5420 < \boxed{5420.01}$

$\boxed{656.99} < 657 < \boxed{657.01}$

$\boxed{43.19} < 43.2 < \boxed{43.21}$

$\boxed{2.92} < 2.93 < \boxed{2.94}$

Extension T points to a number.
Ps round it to the nearest 1000,
(100, 10, 1 or tenth as appropriate).

40 min

Individual work monitored, helped

Written on BB or use enlarged copy master or OHP

Differentiation by time limit and extension.

Discussion, reasoning, agreement, self-correction, praising

T points to one or two inequalities and Ps read them starting from the left (right, in the middle).

Praising, encouragement only

Bk4

Lesson Plan 87

Activity | ***Notes***

8

Book 4, page 87

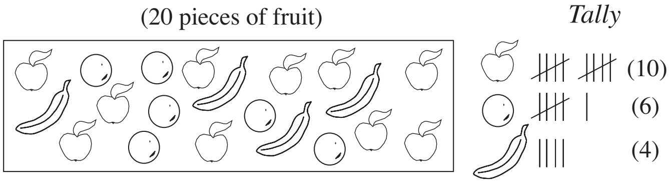
Q.4 Read: *These were the fruit that 20 children in a class brought for their lunch.*

Ask Ps to make a <u>tally</u> first by drwing a vertical line for each piece of frut inside the box and then colouring it to show that it has been counted. Demonstrate on BB if necessary.

Review totals for each type of fruit. Ps with incorrect totals check and correct them. Now let's answer the questions.

A P reads each question aloud, then class shows the answer on scrap paper or slates on command. Ps responding correctly explain to those who were wong. Mistakes discussed and corrected.

Solution:



a) *What fraction of the fruit were apples?* $\left(\dfrac{10}{20} = \dfrac{1}{2}\right)$

b) *What fraction of the fruit were oranges?* $\left(\dfrac{6}{20} = \dfrac{3}{10}\right)$

c) *What fraction of the fruit were bananas?* $\left(\dfrac{4}{20} = \dfrac{1}{5}\right)$

d) *Which was the most popular fruit?* (apple)

Which was the least popular fruit? (banana)

Individual work, imonitored, helped

Fruit drawn (or stuck) on BB or use enlarged copy master/OHP

Quick revision on how to make a tally if necessary.

Agreement, self-correcting, praising

Whole class activity

Reasoning, agreement, praising

Extension

Sometimes we can give a part of a whole by thinking of the whole as 100 equal parts. Each of these 100 parts is called a <u>percentage</u>.

We say that 1 out of 100 is 1 <u>per cent</u>. 'Per cent' comes from the old Roman language, Latin, and means 'out of 100', so 1 percent means 1 out of 100 or 1 hundredth. What percentage would the whole be? (100 per cent, i.e. 100 hundredths or 100 out of 100)

Who knows how to write the mathematical symbol for 'per cent'? T shows it if no P knows. (%)

How many percentages would be in 1 half? (50) Who can come and write it on the BB? Who agrees? etc.

Repeat for each of the other fractions in the answers above.

[This is meant to familiarise Ps with percentage but do not expect Ps to learn it yet.]

Whole class discussion

Allow Ps to tell what they know about percentages. If no P can explain, T does so.

BB: <u>Percentage</u> (part of 100)

<u>per cent</u> means <u>out of 100</u>

$$1 = \frac{100}{100} = 100\%$$

$$\frac{1}{2} = \frac{50}{100} = 50\%$$

$$\frac{3}{10} = \frac{30}{100} = 30\%$$

$$\frac{1}{5} = \frac{2}{10} = \frac{20}{100} = 20\%$$

45 min

Bk4

R: Calculations

C: Natural numbers, fractions and decimals

E: Problems. Cube, cuboid, solids

Lesson Plan 88

Activity

Notes

1

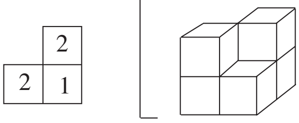
Solids

These are the ground plans of two solids. (BB) Build them with unit cubes then count their volume and surface area.

T chooses Ps to show their solids to class (or T has large models already prepared). What is the volume (surface area) of this solid?
Ps show on scrap paper or slates on command, or T chooses Ps to give the volume and surface area and class agrees/disagrees.

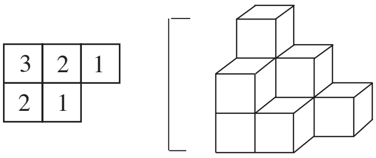
BB: Ps:

a)



V = 5 unit cubes
A = 22 unit squares

b)



V = 9 unit cubes
A = 32 unit squares

Individual (or paired) work, monitored, helped

Ps have unit cubes on desks.

Agreement, praising

Feedback for T

6 min

2

Comparing volume and area of cuboids

T has large cubes for demonstration and Ps have cm cubes on desks if possible. T has table drawn on BB and Ps have a copy on desks too.

T (or a P) explains what each row of the table means, using a 1 cm cube and filling in the first column in the table. (L = length of the horizontal edge, A = area of its surface in cm squares, V = volume in cm cubes)

Now let's make a cuboid with horizontal edge of length 2 cm. Agree that the width and height are still 1 cm but the length has increased by 1 cm Let's fill in the 2nd column in the table. Ps come to BB or dictate to T. Class checks by counting the squares and cubes.

If Ps have no cm cubes, continue in this way as a whole class activity, dealing with one column at a time and with Ps filling in their tables too. Otherwise, Ps work individually (or in pairs), building the cuboids of increasing horizontal length and filling in the appropriate columns in their table. In the latter case, set a time limit and review at BB with the whole class. Ps come to BB or dictate their results. Class agrees/disagrees. Mistakes corrected.

BB:

L	1	2	3	4	5	6	7	8	9	10	12	16	(cm)
A	6	10	14	18	22	26	30	34	38	42	50	66	(cm squares)
V	1	2	3	4	5	6	7	8	9	10	12	16	(cm cubes)

What do you notice? Is there a rule for the table? Elicit that for a cuboid with height and width of 1 unit, but a different length

$$V = L \quad \text{and} \quad A = L \times 4 + 2$$

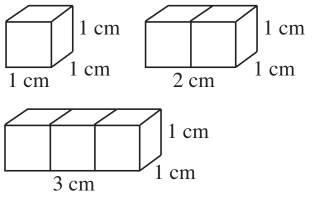
Who can explain it? (Volume is the number of 1 cm cubes used, which is the same number as the horizontal length. Area of surface consists of 4 faces [top, bottom, front, back] which are lengthening but the two end faces stay as 1 cm squares)

Extension

If I made a cuboid with 100 (1000) cm cubes laid end to end, what would its length (volume, surface area) be?

Whole class activity to start, then individual (paired) work, monitored, helped

Table drawn on BB or use enlarged copy master or OHP, with copies for Ps.



etc.

(Cuisennaire rods could be used instead of cm cubes if class has them.)

At a good pace

Demonstration, reasoning, agreement, self-correction, praising

Discussion, checking, agreement, praising

Extra praise if Ps noticed the relationships while completing the table.

L = 100 (1000) cm

V = 100 (1000) cm cubes

$A = 100 \times 4 + 2 = 402$ (cm^2)
[$1000 \times 4 + 2 = 4002$ (cm^2)]

16 min

Bk4

Lesson Plan 88

Activity

Notes

3

Changing the unit of measure

In the last activity, we used 1 cm as the unit of length to measure the cuboids we made. Let's show in this table what their lengths would be if we used some of the other cuboids as the unit of measure.

T holds up each cuboid as it is dealt with, saying, 'If the length of this cuboid is 1 unit, how many units are the lengths of the other cuboids?'

Ps come to BB to fill in one column at a time, explaining reasoning. Class agrees/disagrees. In most cases (apart from the thirds, which is rather difficult), elicit what the fraction would be as a decimal too.

BB:

	Unit				
Length	1 cm	2 cm	3 cm	4 cm	5 cm
1 cm	①	$\frac{1}{2} = 0.5$	$\frac{1}{3}$	$\frac{1}{4} = 0.25$	$\frac{1}{5} = 0.2$
2 cm	2	① $= \frac{2}{2}$	$\frac{2}{3}$	$\frac{2}{4} = \frac{1}{2} = 0.5$	$\frac{2}{5} = 0.4$
3 cm	3	$\frac{3}{2} = 1\frac{1}{2} = 1.5$	① $= \frac{3}{3}$	$\frac{3}{4} = 0.75$	$\frac{3}{5} = 0.6$
4 cm	4	$\frac{4}{2} = 2$	$\frac{4}{3} = 1\frac{1}{3}$	① $= \frac{4}{4}$	$\frac{4}{5} = 0.8$
5 cm	5	$\frac{5}{2} = 2\frac{1}{2} = 2.5$	$\frac{5}{3} = 1\frac{2}{3}$	$\frac{5}{4} = 1\frac{1}{4} = 1.25$	① $= \frac{5}{5}$
6 cm	6	$\frac{6}{2} = 3$	$\frac{6}{3} = 2$	$\frac{6}{4} = 1\frac{1}{2} = 1.5$	$\frac{6}{5} = 1\frac{1}{5} = 1.2$
7 cm	7	$\frac{7}{2} = 3\frac{1}{2} = 3.5$	$\frac{7}{3} = 2\frac{1}{3}$	$\frac{7}{4} = 1\frac{3}{4} = 1.75$	$\frac{7}{5} = 1\frac{2}{5} = 1.4$
8 cm	8	$\frac{8}{2} = 4$	$\frac{8}{3} = 2\frac{2}{3}$	$\frac{8}{4} = 2$	$\frac{8}{5} = 1\frac{3}{5} = 1.6$
9 cm	9	$\frac{9}{2} = 4\frac{1}{2} = 4.5$	$\frac{9}{3} = 3$	$\frac{9}{4} = 2\frac{1}{4} = 2.25$	$\frac{9}{5} = 1\frac{4}{5} = 1.8$
10 cm	10	$\frac{10}{2} = 5$	$\frac{10}{3} = 3\frac{1}{3}$	$\frac{10}{4} = 2\frac{1}{2} = 2.5$	$\frac{10}{5} = 2$
12 cm	12	$\frac{12}{2} = 6$	$\frac{12}{3} = 4$	$\frac{12}{4} = 3$	$\frac{12}{5} = 2\frac{2}{5} = 2.4$
16 cm	16	$\frac{16}{2} = 8$	$\frac{16}{3} = 5\frac{1}{3}$	$\frac{16}{4} = 4$	$\frac{16}{5} = 3\frac{1}{5} = 3.2$

Whole class activity

Table drawn on BB or use enlarged copy master or OHP

T could do one or two rows in the 2 cm column as a model for Ps to follow.

At a good pace

Reasoning, agreement, praising

[If Ps want to write the thirds as decimals, first elicit or tell that:

BB: $\frac{1}{3} \approx 0.33$

(as it is nearer 0.33 than 0.34)

$\frac{2}{3} \approx 0.67$

(as it is nearer 0.67 than 0.66)

and Ps should write ≈ rather than =]

26 min

4

Book 4, page 88

Q.1 Read: *Imagine these cubes built from unit cubes.*
Fill in the missing numbers.

Elicit that this time the length, width and height of the cube are being increased by the same amount (rather than just the length as in the earlier activity).

How can we calculate the area and volume without needing to build the cubes? T asks several Ps what they think. T gives hints if nobody knows. Elicit that, for a <u>cube</u>:

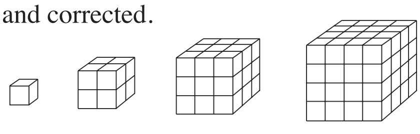
$A = L \times L \times 6$ (each face is a square, so length equals height, and there are 6 equal faces.)

$V = L \times L \times L$ (as length = height = width)

Set a time limit for Ps to complete the table. Necessary calculations can be done in *Ex. Bks*.

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

Solution:



Length of 1 edge ⊢⊣	1	2	3	4	5	6
Area of cube □	6	24	54	96	150	216
Volume of cube	1	8	27	64	125	216

Whole class discussion to elicit relationships, then individual calculation.

Drawn on BB or use enlarged copy master or OHP

T could have a large model already prepared for Ps to refer to in their explanations.

Discussion, agreement, praising

Individual work, monitored, helped

Differentiation by time limit

Reasoning, agreement, self-correcting, praising

Write details on BB if problems, e.g.

$L = \underline{5}$ units

$A = 5 \times \overset{30}{5 \times} 6 = \underline{150}$ unit (squares)

$V = 5 \overset{25}{\times} 5 \times 5 = \underline{125}$ unit (cubes)

etc.

32 min

Bk4

Lesson Plan 88

Activity

Notes

5

Book 4, page 88

Q.2 Read: *Imagine the cuboid which has this net. Calculate its surface area and volume. Complete the table.*

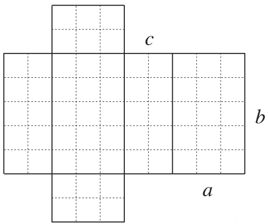
If possible, Ps have copies of the net on desks to fold into the cuboid as a check, and/or T has a large demonsration model already folded to show to class.

What do the letters in the table stand for? (*a*, *b* and *c* are the length, width and height [in units] of the cuboid and this time they are all different lengths. *A* is the surface area [in unit squares] and *V* is the volume [in unit cubes])

Ps find the values of *a*, *b* and *c* in the diagram by counting the grid squares, then calculate the area and volume in *Ex. Bks*.

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

Solution:



a ⟼	b ⟼	c ⟼	A □	V ▣
3	5	2	62	30

Details:
$$\begin{aligned} A &= 2 \times (3 \times 5 + 3 \times 2 + 5 \times 2) \\ &= 2 \times (15 + 6 + 10) \\ &= 2 \times 31 = \underline{62} \text{ (unit squares)} \end{aligned}$$

$V = 3 \times 5 \times 2 = 3 \times 10 = \underline{30}$ (unit cubes)

36 min

Individual work. monitored, helped

Drawn on BB or use enlarged copy master or OHP

(Copied onto card and cut out for Ps to fold and make up.)

Discussion, agreement

Set a time limit.

Ps can check their calculated area by counting the grid squares on the net.

Reasoning, agreement, self-correction, praising

Elicit by referring to the made-up model that for a cuboid with a different length, width and height:

$A = 2 \times (a \times b + a \times c + b \times c)$

$V = a \times b \times c$

6

Book 4, page 88, Q.3

The children in a class were allowed to choose which game they would like to play during their physical education lesson. They could choose from basketball, football or tennis.

Read: *The pie chart shows which part of the class chose which game to play.*

Why do you think this kind of diagram is called a <u>pie chart</u>? (It looks like a pie cut into slices.) What does the whole circle or 'pie' stand for? (the whole class) What does this part stand for? T points and Ps explain. Which was the most (least) popular sport? (basketball, tennis)

Read: a) *Write each part as a fraction.*

T asks several Ps what they think. How can we check that they are correct? (Divide the circle into 8 <u>equal</u> parts and count how many are shaded in the different colours.) T uses BB ruler to mark the circle.

Read: b) *How many children chose each game if there were 24 pupils in the class?*

Ps come to BB to do calculations and explain reasoning. Class points out errors.

Solution:

B: $24 \div 8 \times 5 = 3 \times 5 = \underline{15}$ (pupils)

F: $24 \div 8 \times 2 = 3 \times 2 = \underline{6}$ (pupils)

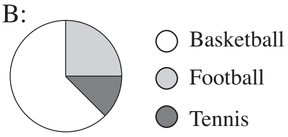
T: $24 \div 8 = \underline{3}$ (pupils)

41 min

Whole class activity

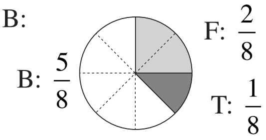
Pie chart drawn on BB or use enlarged copy master or OHP

BB:



Discussion, agreement. praising

BB:



Whole class activity

(or individual work in *Ex. Bks* and Ps show results on scrap paper or slates on command).

Reasoning, agreement, (self-correcting,) praising

Check: $15 + 6 + 3 = 24$ ✔

Bk4

Lesson Plan 88

Activity

7

Book 4, page 88

Q.4 Read: *Solve the equations*.

Let's see how many of these you can do in 3 minutes!

Start . . . now! . . . Stop!

Review at BB with whole class. Ps dictate to T, saying the whole equation. T writes on BB. Class agrees/disagrees. Ps mark/correct own work. Only ask for details of reasoning if there is disagreement.

Who made a mistake? What was your mistake? Deal with all cases. Who did not finish them?

Stand up if you had them all correct! Let's give them 3 cheers!

Solution:

a) i) $3 + \boxed{\mathbf{8}} = 11$ ii) $\boxed{\mathbf{180}} + 820 = 1000$ iii) $\frac{3}{7} + \boxed{\mathbf{\frac{3}{7}}} = \frac{6}{7}$

iv) $\boxed{\mathbf{\frac{7}{9}}} + \frac{2}{9} = 1$ v) $2.3 + \boxed{\mathbf{1.7}} = 4$ vi) $\boxed{\mathbf{0.4}} + 0.6 = 1$

b) i) $7 - \boxed{\mathbf{5}} = 2$ ii) $\boxed{\mathbf{1820}} - 820 = 1000$ iii) $\frac{8}{9} - \boxed{\mathbf{\frac{6}{9}}} = \frac{2}{9}$

iv) $\boxed{\mathbf{\frac{2}{3}}} - \frac{1}{3} = \frac{1}{3}$ v) $4.3 - \boxed{\mathbf{1.2}} = 3.1$ vi) $\boxed{\mathbf{1}} - 0.6 = 0.4$

45 min

Notes

Individual work, monitored

Written on BB or use enlarged copy master or OHP

Or T could have solution already prepared and uncover each answer as it is dealt with.

Agreement, self-correction, evaluation, praising

Feedback for T

Let's give the whole class 3 cheers for working so hard!