8 Ordering Numbers

A Biggest

1 For each set of shapes, colour the shape with the biggest number red.

a) 98 — 205 — 179

b) 198 — 189 — 891

c) 243 — 324 — 234

d) 822 — 798 — 807

2 Riley has these 3 cards with digits on them.

a) Write down the biggest number Riley can make with the 3 digits.

b) Write down the smallest number Riley can make.

B Mini Maze

1

Maze Rules

Always move to a box with a higher number.
You are allowed to go up ↑, down ↓ and sideways ←→, but not sloping ↙ ↘.

Find a path through this maze.
Work in pencil until you find a path to the finish.
When you have found a pathway colour it.

Start			
100	275	160	145
193	220	513	530
212	218	443	528
207	1025	1000	815
1145	1003	961	905
1324	1470	925	697
1582	1740	1963	2000
			Finish

C Film Stars



	pairs of shoes	year of birth	last movie earnings
Lovely Lola	258	1976	$50 200
Funny Faye	191	1968	$38 800
Action Annie	225	1980	$51 750

1 Write in words the earnings of Lovely Lola. .....

.....

2 Which film star has the most pairs of shoes? .....

3 Who is the oldest film star? .....

4 Who earned the most money from her last movie? .....

Dividing Large Numbers 35

A Half

Dividing by 2 is the same as **halving**.

Examples : Find a) half of 86 b) half of 74

Working :

a) Since 86 equals 80 + 6, then
half of 86 is 40 + 3 = 43

b) There are two ways to find half of 74
either - half of 70 + 4 is 35 + 2 = 37
or - half of 60 + 14 is 30 + 7 = 37
Do what you find easiest.

1 Find.

a) half of 48 = ...

b) half of 54 = ...

c) half of 62 = ...

d) 46 ÷ 2 = ...

e) 58 ÷ 2 = ...

f) 94 ÷ 2 = ...

Dividing an amount into 4 equal parts can be done by **halving one half**.

The diagram shows that
96 ÷ 4 = 24

96	
48	48
24 24	24 24

2 Calculate.

a) 84 ÷ 4 = ...

b) 68 ÷ 4 = ...

c) 56 ÷ 4 = ...

B Take Away Large Amounts

Example : There are 92 chairs to be evenly distributed over 4 classrooms. How many chairs in each room?

In symbols : 92 ÷ 4 = ...

Working : We do repeated subtraction in lots of 10 chairs.

92	
- 40	10 chairs to each room
52	
- 40	10 chairs to each room
12	
- 12	3 chairs to each room
0	23 chairs to each room

In symbols : 92 ÷ 4 = 23

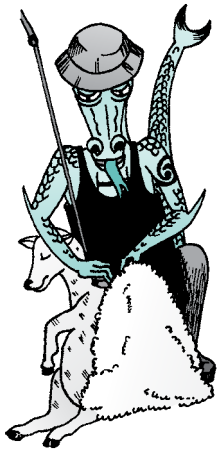
1 A teacher has a box with 84 dice in it. How many sets of 3 dice can she make?
Calculate : 84 ÷ 3

8 4
- 3 0 ***10 sets of 3 dice***
.....
- ....
.....
- ....
0
.....

84 ÷ 3 = ...

2 Ninety-five sheep will be shorn by 5 shearers. They shear the same amount. How many sheep each?

.....
.....
.....
.....
.....
.....
.....
..... sheep each.



A Naughty Dog!

1 A dog owner asks the vet : *"My dog chases everyone he sees on a bike. What can I do?"*

The vet answers :

Use the clues to find. the answer.

30	8	0	7	6	12	30	3	27	11	2	6	12	10	6	16	11
							A									

$\frac{1}{3}$ of 9 = ... **A**

$\frac{2}{5}$ of 25 = ... **B**

$\frac{3}{4}$ of 40 = ... **C**

$\frac{1}{2}$ of 22 = ... **E**

$\frac{1}{4}$ of 28 = ... **F**

$\frac{2}{8}$ of 8 = ... **H**

$\frac{3}{6}$ of 12 = ... **I**

$\frac{2}{3}$ of 24 = ... **K**

$\frac{1}{2}$ of 0 = ... **N**

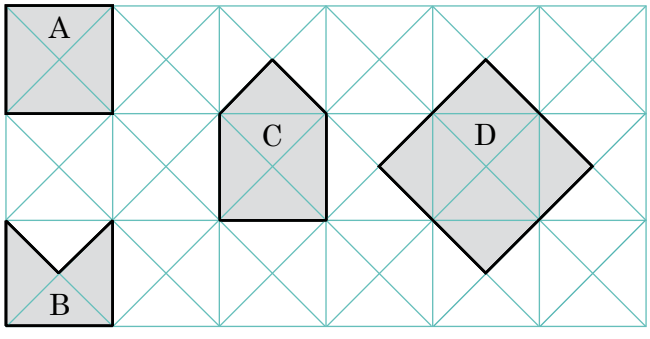
$\frac{2}{3}$ of 12 = ... **O**

$\frac{3}{5}$ of 20 = ... **S**

$\frac{3}{4}$ of 36 = ... **T**

B Shapes and Sizes

1



Here are four shapes drawn on a triangle grid. If shape A has size 1, what would be the sizes of the other shapes?

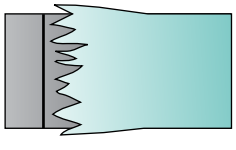
shape B = size .....

shape C = size .....

shape D = size .....

C Estimations

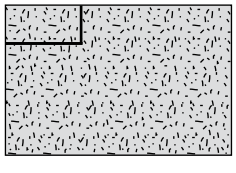
1



Phoebe broke one strip off this block of chocolate.

What fraction of the block did she break off? .....

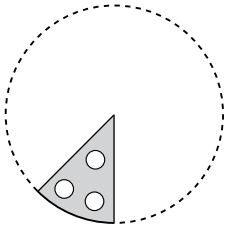
2



Ruby made a slab of fudge, she cut off a slice to taste it.

What fraction of the slab did she taste? .....

3



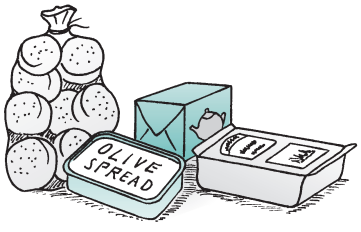
A cake had little chocolates spread evenly over the top. This is the last piece. It has 3 chocolates. Work out how many chocolates there were on the whole cake.

The cake had ..... chocolates.

An **estimation** is a *rough calculation*. When you are asked to estimate an answer, you round all the decimal numbers in the calculation to whole numbers. Then you **mentally do the calculation** with these rounded numbers.
Always mentally estimate the answer when using a calculator. That way you can spot when keying-in errors have been made.

A Groceries

1 These are the groceries Mia bought.



a) Fill in a rounded whole dollar price for each item.

grocery list

item	price	estimate
tea bags	$4.27	$ .....
cheese	$8.99	$ .....
bread rolls	$3.85	$ .....
spread	$5.29	$ .....
Total	$	$ .....

b) Mentally add all rounded numbers. Write your estimated total on the table.

c) Use a calculator to find out how much Mia has to pay. Write this total on the table also.

d) How much change does Mia get from $30?

.....

2 Use an estimate to see whether a ten dollar note is enough to pay for four ice creams at $2.95 each.

.....

.....

3 Will twenty dollars be enough to buy 10 bottles of soft-drink at $1.89 each? Say why.

.....

.....

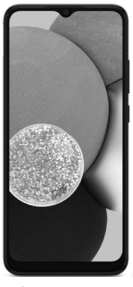
B Checking Answers

Do not use a calculator for these.

1a) Anne plans to buy a new cell phone. Write the whole dollar estimate for each phone.

$124.45 .....

$99.95 .....



$257.25 .....

b) Anne calculates the difference in price between the dearest and the cheapest model. She gets $132.80. Is this answer what you would expect? Use the estimates to check.

.....

.....

2 Logan places 3 planks end to end. Their lengths are 6.8 metres, 3.4 metres and 5.2 metres. Logan reckons the total length is 18.4 metres. Can this be right? Use estimates to check.

.....

.....

.....

3 One atlas weighs 1.2 kg. Emily calculates that three atlases weigh 3.6 kg. Can this be right?

Explain. .....

.....

.....

.....

64 Follow Instructions

A Using a Rule

1 Write down number chains of 5 numbers using the rules below.

a) Rule : The first number is 16, each number is half of the number before.

Chain : ....., ..., ..., ..., ...

b) Rule : The first number is 3, each number is double the number before.

Chain : ....., ..., ..., ..., ...

c) Rule : The first number is equal to 1 x 1, the second is equal to 2 x 2, the third 3 x 3 and so on.

Chain : ....., ..., ..., ..., ...

B Sausage Sizzle

1 Every guest at the sausage sizzle is expected to eat 3 sausages. How many sausages are needed for . .

a) 6 guests? .....

b) 30 guests? .....

2 The cost of hiring the town hall for a party is found like this : "You pay $100 for each hour, then you pay $50 for the cleaning up at the end."

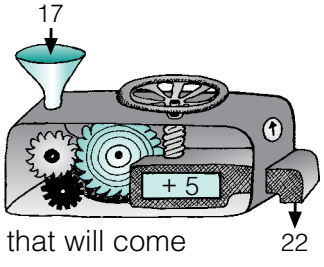
Calculate the cost of hiring the town hall for . . .

a) 4 hours .....

b) 8 hours .....

C The Number Cruncher

A *Number Cruncher* changes numbers using a displayed rule. This one adds 5 to any number going in.



1 Write down the number that will come out if the machine is set to these rules :

a) 17 → + 5 → **22**; 20 → + 5 → .....; 91 → + 5 → .....

b) 21 → − 8 → .....; 39 → − 8 → .....; 85 → − 8 → .....

c) 4 → x 3 → .....; 8 → x 3 → .....; 10 → x 3 → .....

d) 18 → ÷ 2 → .....; 24 → ÷ 2 → .....; 42 → ÷ 2 → .....

e) 17 → − 15 → .....; 40 → − 15 → .....; 72 → − 15 → .....

f) 6 → ÷ 6 → .....; 18 → ÷ 6 → .....; 54 → ÷ 6 → .....

D Double Rules

1 Write down the number that will come out if the machine is set to these double rules. The first one is done for you. Find out how it works.

a) 10 → first + 3 → **13** → then x 2 → **26**; 12 → first + 3 → ..... → then x 2 → .....; 20 → first + 3 → ..... → then x 2 → .....

b) 6 → first x 3 → ..... → then − 5 → .....; 7 → first x 3 → ..... → then − 5 → .....; 9 → first x 3 → ..... → then − 5 → .....

c) 8 → first ÷ 2 → ..... → then x 5 → .....; 14 → first ÷ 2 → ..... → then x 5 → .....; 18 → first ÷ 2 → ..... → then x 5 → .....

d) 17 → first − 9 → ..... → then ÷ 4 → .....; 33 → first − 9 → ..... → then ÷ 4 → .....; 45 → first − 9 → ..... → then ÷ 4 → .....

A Touring the South Island

Chris and Sarah are renting a camper van for a circuit of the South Island. They will visit four places. The table shows the places and the distances Chris and Sarah must travel from one place to the next.

From	To	Distance (km)
Christchurch	Greymouth	244
Greymouth	Wanaka	458
Wanaka	Dunedin	276
Dunedin	Christchurch	361

1a) What is meant by the word *circuit*? .....

.....

b) Round the four distances in the table to the nearest 100. ....., ..., ..., ...

c) Looking at the rounded distances Sarah estimates that this round trip will be more than 1200 kilometres long. Do you agree? Show why.

.....

.....

.....

2a) How far must Chris and Sarah travel in total to get from Christchurch to Greymouth and then on to Wanaka?

.....

.....

.....

.....

b) When they arrive in Wanaka, Chris reckons they are halfway on their circuit. Is that true? Explain.

.....

.....

.....

.....

.....

.....

A Volumes and Weights

Carefully select a **common unit** when adding or subtracting quantities measured in different units.

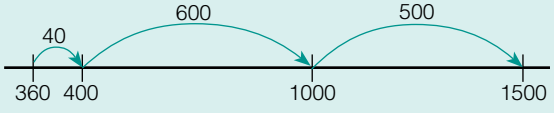
Example :
Ethan opens a 1.5 litre bottle of juice and pours 3 glasses of 120 mL each.
What volume of juice is left in the bottle?

Working :
The volumes in this question are measured in litres and in millilitres. Start by changing L into mL.

The bottle has 1.5 L = 1000 mL + 500 mL = 1500 mL.

Three glasses of 120 mL = (120 + 120 + 120) mL
= 360 mL.

Left in the bottle = 1500 mL – 360 mL.



Answer : 1140 mL of juice left in the bottle.

1 Isabella mixes 450 mL of freshly squeezed orange juice and 200 mL of grapefruit juice.
How much water should she add to get 1 litre of citrus drink?

……..

……..

……..

……..

……..

2 A baker mixes dry ingredients to make some fruit cakes. He uses 800 g sugar, 1.7 kg flour and 400 g of raisins and sultanas.
The baker estimates that these dry ingredients together weigh more than 3 kg.
Do you think that is correct? Explain your answer.

……..

……..

……..

……..

……..

B Lengths and Heights

1 Liam stacks 5 blocks to make a tower.
Each block is 24 mm high.

a) How many millimetres high is the tower?

……..

……..

b) Give your answer in centimetres.

……..

2 Olivia has 10 brand-new pencils in her pencil-case; they are all 17 cm long. She lays them out, end to end, in a straight line. Olivia finds that the line of pencils is longer than 1 metre.
How much longer?

……..

……..

……..

……..

3 A new book has arrived in a book shop.
The shopkeeper is stacking twenty of these books on a pile, which is exactly 1 metre high.
How many centimetres thick are the books?

……..

……..

……..

……..

98 Triangles and Quadrilaterals

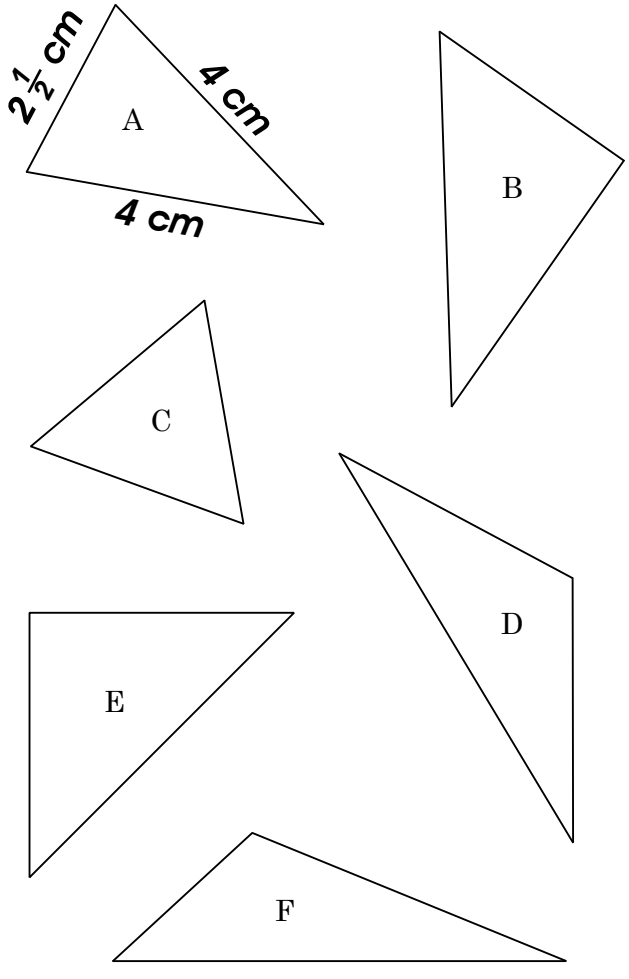
Geometry

A Special Triangles

A flat shape with 3 straight sides is called a **triangle**.
If it also has a right angle, it is called a **right-angled triangle**.
If two of the sides have the same length we call it an **isosceles triangle**.
If all three sides have the same length we call it an **equilateral triangle**.

1a) Measure the sides of these triangles. Write the measurement on the sides. One is done for you.

b) Colour red all the *right angles* you can find.



2a) List the right-angled triangles. .....

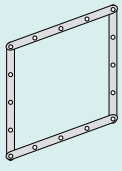
b) List the isosceles triangles. .....

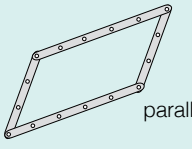
c) List the equilateral triangles. .....

d) Which triangle is not special? .....

B Special Quadrilaterals

A flat shape with 4 straight sides is called a **quadrilateral**.
If you select four *equal* strips from a Meccano set to make a quadrilateral, then the shape you get is called a **rhombus**.
If you make a quadrilateral with its opposite sides of equal length, then the shape you get is called a **parallelogram**.


rhombus

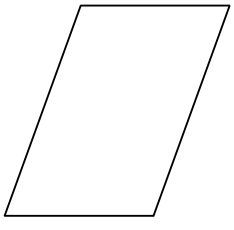

parallelogram

1 Write correct names on these quadrilaterals.

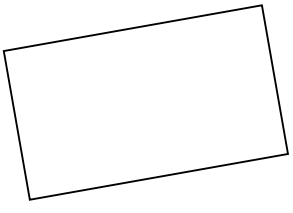
rhombus parallelogram square rectangle

Hint : Measure the sides with your ruler and check for right angles.

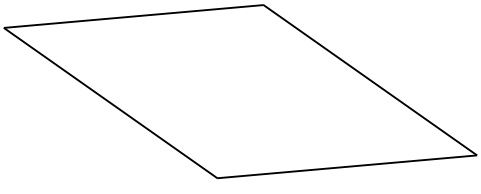
a)



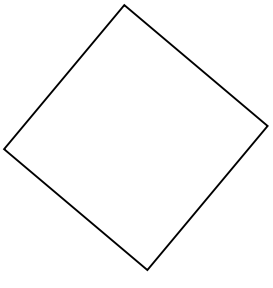
b)



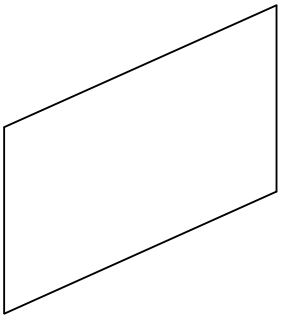
c)



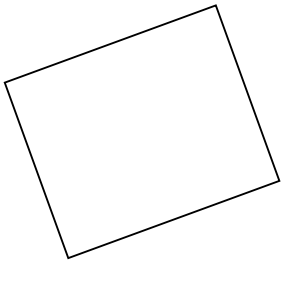
d)



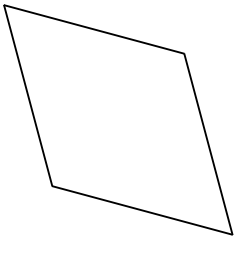
e)



f)



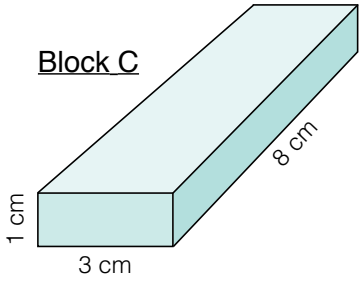
g)

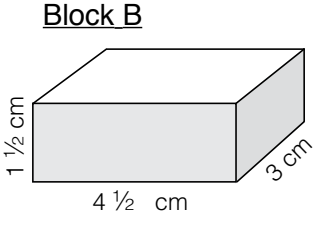


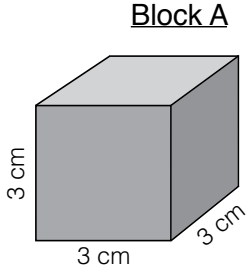
A Buildings

1 Ryan has a large number of blocks. Three of these are shown in the picture. Ryan has measured some of the edges.

What is the highest possible tower Ryan can build with the 3 different blocks shown - A, B and C?







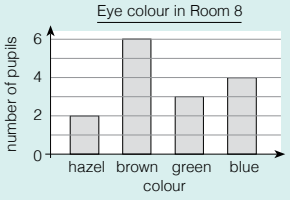
2 On thin cardboard draw a net to make a cuboid the same size as block B.
Cut the net out, then fold it and join the faces with sticky tape.

3 For this exercise you need 3 cardboard blocks of size B. You could borrow them from your classmates.
Use the 3 blocks to form an interesting building. Describe your building - with words and diagrams - in such a way that other people know exactly how to build it without looking at your building.

122 Bar Graphs

When doing a survey we often use a tally table to record the **information** we are gathering. Another word for information is **data**. When we have all the data we can draw a **diagram** (**graph**) to show what we have found out. We have already used a **block graph** on page 121.

A **bar graph** is similar to a block graph, but it must have a **scale** on the **side** of the graph. With this scale we show the number of times a certain score appeared in the survey.



Example : a) How many pupils in Room 8 have green eyes?
b) What is the most common eye colour?

Answers : a) Three pupils have green eyes. b) Brown is most common.

A Happy Families

1 Kiri's class made a tally table on the board in which each pupil showed their place in their family.

family place	tally
only child	𝍸 |
youngest child	||||
middle child	𝍸 |
oldest child	𝍸 |||

a) Kiri has one older sister and two younger brothers. To which group does Kiri belong?

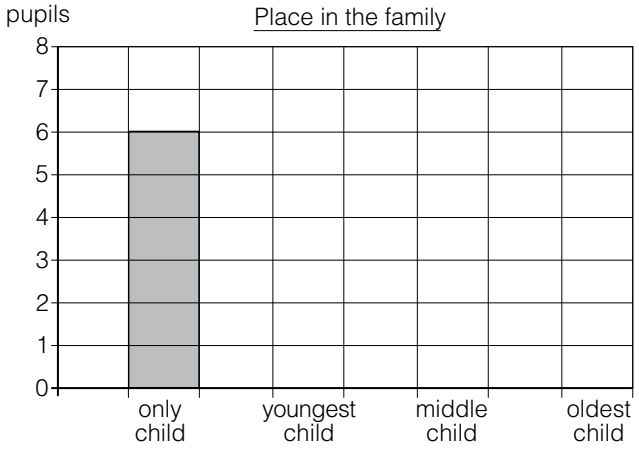
Kiri is a ..... child.

b) How many pupils are the youngest child in their family? .....

c) How many pupils have an older brother or sister?

.....

2 Complete this bar graph for the data.

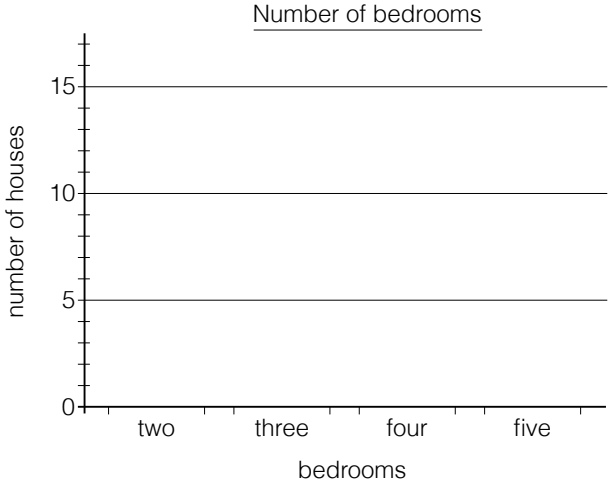


B Bedrooms

The class also made a tally table for the number of bedrooms each pupil has in their home.

number of bedrooms	tally
2 bedrooms	𝍸 |||
3 bedrooms	𝍸 𝍸 ||||
4 bedrooms	
5 bedrooms	||

1 Draw a bar graph for this data.



2 Complete these comments with a correct number.

a) Most of the houses in this survey have ..... bedrooms.

b) There are ..... houses with five bedrooms.

c) All the pupils' homes have at least ..... bedrooms.

d) None of the houses have ..... bedrooms.

e) The largest number of bedrooms is .....

A1 Answer Section

Pages 4 - 18
Adding and Subtracting

Page 4 - Reading and Writing Numbers

A1 a) figures : 4270
words : four thousand, two hundred and seventy.
b) figures : 3151
words : three thousand, one hundred and fifty-one.
c) figures : 1069
words : one thousand and sixty-nine
d) figures : 6300
words : six thousand and three hundred.

Page 5 - Stacking an Abacus

A1 a) 2510 b) 1051
A2 a) 2000 + 800 + 30 + 5 b) 5000 + 300 + 90
c) 600 + 40 + 1 d) 1000 + 8
A3 a) 3578 b) 8029 c) 404 d) 2300
A4 Because, 10 ones make a ten, 10 tens make a hundred and so on.
B1 a) 1404 b) 1494
B2 a) 3610 b) 4002
B3 a) 6760 b) 6788 c) 6808 d) 6958
e) 7058

Page 6 - Counting

A1 a) 200, 210, 220, 230, 240.
b) 100, 95, 90, 85, 80
c) 800, 900, 1000, 1100, 1200
d) 78, 76, 74, 72, 70
A2 a) 550 b) 600 c) 901 d) 1000
e) 1090 f) 1210 g) 1500 h) 2000
i) 2601 j) 3010 k) 6645 l) 10 000
A3 a) 59 b) 399 c) 4039 d) 5999
e) 7199 f) 9899
A4 a) sixteen b) sixty-five
c) three hundred and fifty
d) seven thousand and eighty-two
B1 a) sixty-five thousand b) 66 000
c) After 99 000 comes 100 000
B2 a) nine thousand, four hundred and sixty
b) twenty-four thousand and three hundred
c) one hundred and forty-five thousand
d) fifty-nine thousand, one hundred and forty

Page 7 - Other Counting Systems

A1 a) iwa tekau mā rima b) whā rau mā tahi
c) ono rau mā toru tekau d) waru mano mā iwa rau
e) kotahi mano mā whā rau mā rua
A2 a) 9170 b) 3062
B1 XI, XII, XIII, XIV, XV, XVI, XVII, XVIII, XIX, XX
B2 a) XXXIV b) LV c) XCVIII
B3 a) 67 b) 29 c) 125

Page 8 - Ordering Numbers

A1 a) red 205 b) red 891 c) red 324 d) red 822
A2 a) 853 b) 358
B1 pathway of numbers : 100, 193, 212, 218, 443, 528, 815, 905, 961, 1003, 1470, 1740, 1963, 2000.
C1 fifty thousand and two hundred dollars
C2 Lovely Loa C3 Funny Faye C4 Action Annie

Page 9 - Puzzles

A1 a) 48 b) 100 A2 a) 20 b) $8300
B1 999 B2 93 B3 5999
C1 clues across : clue 2 - 160; clue 4 - 3402; clue 6 - 54 005; clue 8 - 9804; clue 9 - 695
clues down : clue 1 - 235; clue 2 - 10 085; clue 3 - 6200; clue 5 - 4499; clue 7 - 549

Page 10 - Basic Adding

A1 a) 9 b) 40 c) 80 d) 38
e) 63 f) 309 g) 474 h) 895
i) 593 j) 718
A2 a) 715 b) 886 c) 9500 d) 4900
B1 a) 6 b) 20 c) 9 d) 70
e) 500 f) 400
B2 a) 3 b) 8 c) 2 d) 6
e) 60 f) 40 g) 200
C1 a) 69 b) 95 c) 58 d) 86
e) 266 f) 155
C2 a) 370 b) 670 c) 690 d) 970
e) 860 f) 990

Page 11 - Basic Subtracting

A1 a) 3 b) 30 c) 30 d) 53
e) 34 f) 407 g) 300 h) 920
i) 624 j) 872 k) 273 l) 524
m) 2300 n) 5200
B1 a) 5 b) 3 c) 70 d) 60
e) 400 f) 800
B2 a) 42 b) 65 c) 870 d) 240
e) 4800 f) 7100
C1 a) 15 b) 21 c) 60 d) 43
e) 62 f) 13
C2 a) 340 b) 320 c) 170 d) 700
e) 20 f) 410

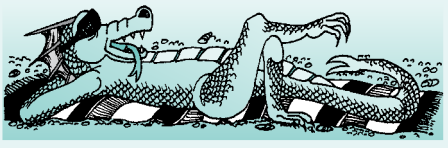
Page 12 - Mental Strategies 1

A1 a) 36 + 4 + 3 = 43 b) 43 + 7 + 1 = 51
b) 124 + 6 + 3 = 133 d) 358 + 2 + 4 = 364
e) 680 + 20 + 30 = 730 f) 260 + 40 + 40 = 340
A2 a) 15 b) 42 c) 103 d) 120
e) 350 f) 660
B1 a) 52 – 2 – 6 = 44 b) 21 – 1 – 3 = 17
b) 95 – 5 – 4 = 86 d) 314 – 4 – 2 = 308
e) 460 – 60 – 20 = 380 f) 710 – 10 – 80 = 620
B2 a) 16 b) 35 c) 118 d) 290
e) 560
C1 S - 56, O - 440,
M - 50, P - 130,
L - 60, B - 192,
H - 240, C - 55,
A - 96

lambchops

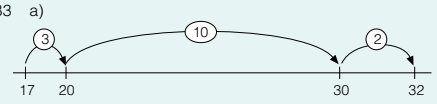
Page 13 - Mental Strategies 2

A1 a) 68 + 2 + 24 = 94 b) 35 + 5 + 22 = 62
c) 17 + 3 + 61 = 81 d) 59 + 1 + 32 = 92
e) 26 + 4 + 44 = 74 f) 14 + 6 + 50 = 70
g) 53 + 7 + 22 = 82 h) 75 + 5 + 13 = 93
i) 97 + 3 + 21 = 121 j) 134 + 6 + 13 = 153
k) 157 + 3 + 35 = 195
B1 a) 57 + 30 – 2 = 85 b) 25 + 20 – 1 = 44
b) 43 + 40 – 1 = 82 d) 32 + 30 – 1 = 61
e) 55 + 40 – 2 = 93
B2 a) 72 – 40 + 1 = 33 b) 94 – 20 + 2 = 76
c) 85 – 60 + 1 = 26 d) 44 – 30 + 1 = 15
e) 97 – 50 + 2 = 49
C1 a) 26 b) 93 c) 62 d) 79
e) 26 f) 84 g) 33 h) 56
i) 18 j) 25 k) 134 l) 94
m) 79 n) 33 o) 179 p) 5



Page 14 - Jumping the Numberline

A1 Jacob has 47 more cards than Max.
A2 a) 59 b) 24 c) 48 d) 76
B1 a) 6, 6 b) 7, 7
B2 a) 3 b) 7 c) 8 d) 8
B3 a)



b) 32 - 17 = 15
B4 a) 48 b) 35 c) 34 d) 67
e) 36 f) 78

Page 15 - Problems and Puzzles

A1 3990 A2 fifty thousand A3 XXIX
A4 50 A5 $32
B1 41 + 41 = 82 ; does not work because 82 has only two digits
58+ 58 = 116 ; does not work because 116 has two digits the same.
73 + 73 = 146 is one example of a correct sum.
students answer for another correct sum.
B2 e.g. 20 –10 = 10; 40 – 20 = 20; 60 – 30 = 30
C1 a) 46 fish b) 18 more C2 120 mice
C3 17 C4 166 small animals

Page 16 - Practice + and –

A1 a) 394 b) 287 c) 887 d) 54
e) 71 f) 420 g) 711 h) 1006
A2 a) 303 b) 232 c) 21 d) 54
e) 208 f) 380 g) 537 h) 875
B1 a) 577 b) 1013 c) 204 d) 95
e) 173 f) 80 g) 335 h) 408
B2 a) 225 b) 240 c) 24 d) 6
e) 8 f) 120 g) 13 h) 490
C1 a) 486 b) 1000 c) 1250 d) 96
e) 365 f) 224 g) 381 h) 525
C2 a) 15 b) 35 c) 16 d) 11
e) 39 f) 25 g) 240 h) 90

Page 17 - Rounding and Estimating

A1 a) 240 b) 200
A2 a) 370 - red b) 400 - red c) 420 - red d) 400 - red
A3 a) 70 b) 30 c) 510 d) 180
e) 600 f) 950
A4 a) 200 b) 800 c) 700 d) 600
e) 1000 f) 100
B1 a) sold last month : 820 magazines, 380 books
sold this month : 660 magazines, 440 books
b) 440 – 380 = 60 more
B2 a) sold last month : 800 magazines, 400 books
sold this month : 700 magazines, 400 books
b) 1500 c) 1500 + 800 = 2300

Page 18 - Adding Large Numbers

A1 a) 80 + 7
50 + 6
130 + 13
answer 143

b) 400 + 20 + 3
200 + 60 + 8
600 + 80 +11
answer 691

c) 500 + 10 + 9
70 + 5
500 + 80 +14
answer 594

d) 300 + 60 + 2
400 + 70 + 8
700 + 130 +10
answer 840

e) 600 + 30 + 5
100 + 80 + 4
700 + 110 + 9
answer 819

A2 477
381
858

400 + 70 + 7
300 + 80 + 4
700 + 150 + 8