Odd and even

1 Place the numbers into the correct box in the table.

	odd	even
3-digit numbers	117, 631, 707, 667	342, 440, 998, 354
4-digit numbers	4009, 3881, 2091, 8125	3234, 5452, 7000, 7778

3234	4009	342	117
440	5452	3881	2091
998	631	7000	354
707	8125	7778	667

2 Is 1004 an odd or an even number? _____even_____ Explain why.

_____ It can be evenly divided into two groups _____

3 Choose numbers from the box to investigate adding odd and even numbers. The first one has been done for you.

27	54	37	62	45	28	31	16

even number + even number	even number + odd number
54 + 28 = 82 (even)	(odd)
odd number + even number	odd number + odd number
(odd)	(even)

4 Choose numbers from the box to investigate multiplying odd and even numbers. The first one has been done for you.

2	3	4	5	6	7	8	9

even number × even number	even number × odd number
4 × 8 = 32 (even)	(even)
odd number × even number	odd number × odd number
(even)	(odd)

Discuss with a partner what you discovered.

Writing 5-digit numbers

**1** Draw a line to match each numeral to its correct name.

a   twenty-three thousand eight hundred and forty-two   **13 906**

b   seventy-seven thousand two hundred and eighteen   **30 691**

c   thirty thousand six hundred and ninety-one   **41 502**

d   thirteen thousand nine hundred and six   **23 842**

e   forty-one thousand five hundred and two   **77 218**

**2** Write the numbers named in these sentences in numerals.

a   Jinny had *twenty-six thousand four hundred and fifty-two* hits on her website.   26 452

b   Greg bought a car for *thirty-two thousand three hundred and fifty* dollars.   32 350

c   Adam flew *seventeen thousand and nineteen* kilometres to London.   17 019

3 Place each number in its box along the number line.

8086   21 300   5032   38 201   18 880   29 422   36 781   30 033
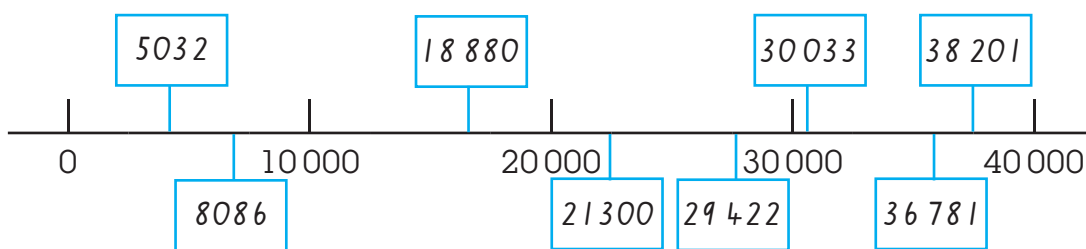
4 Write three numbers that are between the numbers on these number lines.

Answers will vary

Answers will vary

20 000   25 000

65 500   65 600
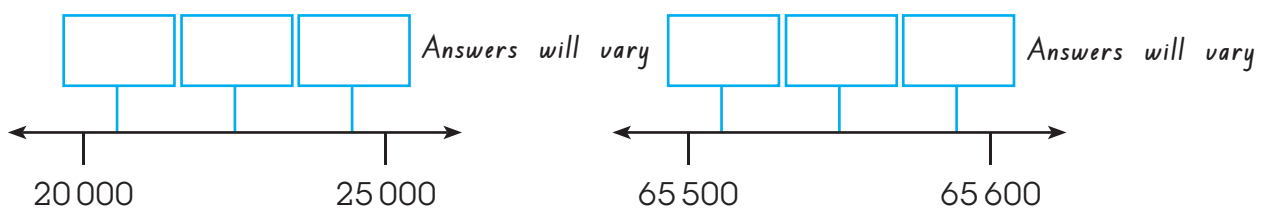
Research Use the internet to find out the prices of different cars. Write down the prices in numerals and words.

2   Number and Place Value

Place value

1 Write the numbers in expanded notation.
The first one has been done for you.

a 65 329 = 60 000 + 5000 + 300 + 20 + 9

b 54 678 = _50 000 + 4000 + 600 + 70 + 8_

c 11 750 = _10 000 + 1000 + 700 + 50_

d 80 325 = _80000 + 300 + 20 + 5_

2 Write the expanded notation as a 5-digit number.

a 40 000 + 5000 + 700 + 20 + 1 = _45 721_

b 50 000 + 4000 + 900 + 30 + 6 = _54 936_

c 90 000 + 7000 + 300 + 10 = _97 310_

d 60 000 + 9000 + 20 + 4 = _69 024_

3 Colour the larger number in each pair.

a | 40 000 + 800 + 2 | 40 000 + 90 + 7 |

b | 10 000 + 10 + 1 | 10 000 + 100 |

4 This calculator shows the number 78 534.
What would you add to make:

a the 4 into a 9? _5_ **b** the 8 into a 9? _1000_

c the 5 into a 7? _200_ **d** the 3 into an 8? _50_

78534

5 Fill in the missing digits of these numbers, which are in order.

| 64 2̲67 | 64 26̲8 | 64 26̲9 | 45 ̲618 | 45 61̲9 | 45 62̲0 | 1̲8 999 | 1̲9 000 | 19 00̲1 |

Did you know that a marathon has a distance of 42 195 metres? Tell a partner about the number 42 195.

Using 5-digit numbers

1 Look at the distances that athletes need to travel from cities aroud the world to get to London for the 2012 Olympic Games.

a Colour the city closest to London in each pair.

Auckland	**Perth**

Singapore	Manila

Mexico City	Rio de Janeiro

City	Distance from London (km)
Auckland	18 329
Mexico City	8939
Manila	13 693
Perth	14 481
Rio de Janeiro	9250
Singapore	10 863

b Which city has a distance with the following place values?

i 5 tens _Rio de Janeiro_

ii 8 hundreds _Singapore_

iii 3 thousands _Manila_

iv 1 one _Perth_

c Write the cities in ascending order according to their distances from London.

Mexico City, Rio de Janeiro, Singapore, Manila, Perth, Auckland

2 Round the cost of each car to the nearest thousand dollars.

$17 200	$22 399	$57 500	$15 990	$39 800
$ _17 000_	$ _22 000_	$ _58 000_	$ _16 000_	$ _40 000_

3 Can you think of a number that when rounded to the nearest:

a ten thousand becomes 70 000? _____

b thousand becomes 70 000? _____
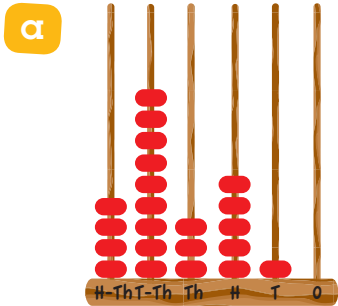
c hundred becomes 70 000? _____

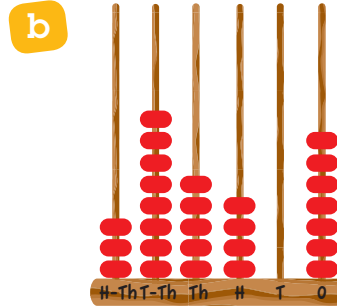_Answers will vary_

Discuss places where you have seen 5-digit numbers.
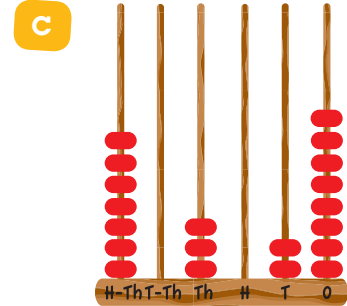
4 **Number and Place Value**

Numbers to 999 999

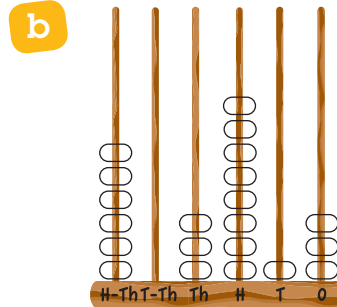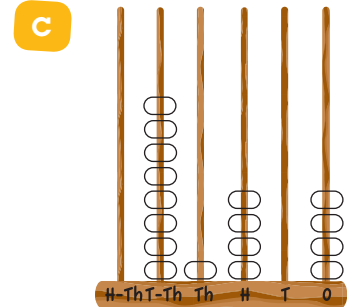**1** Write the number represented by the beads on each abacus in the space provided.

a

H-Th T-Th Th H T O

_493 510_

b

H-Th T-Th Th H T O

_385 407_

c

H-Th T-Th Th H T O

_703 028_

2

2 Draw beads on each empty abacus to represent the numbers.

a

H-Th T-Th Th H T O

992 700

b

H-Th T-Th Th H T O

603 813

c

H-Th T-Th Th H T O

81 404

3 These web page counters show the number of hits each website had in one day.

face Tube	coldmail	whybook	Your maps	WEBNET	i-Pedia
345920	499876	98712	100345	50721	354128

a Read the numbers in Question 3 to a classmate.

b Write down the number of hits Your maps had in words.

one hundred thousand three hundred and forty five

c What is the place value of the '4' in the number of hits on:

i FaceTube? _ten thousands_   **ii** Coldmail? _hundred thousands_

iii Your maps? _tens_   **iv** I-pedia? _thousands_

d List the websites in descending order of number of hits.

Coldmail, I-pedia, FaceTube, Your maps, whybook, webnet

Jump strategy

1 Add 10 to each number.

a) 43 _____53_____   b) 61 _____71_____   c) 88 _____98_____

d) 50 _____60_____   e) 124 _____134_____   f) 265 _____275_____

g) 330 _____340_____   h) 411 _____421_____   i) 589 _____599_____

2 Subtract 10 from each number.

a) 26 _____16_____   b) 45 _____35_____   c) 77 _____67_____

d) 60 _____50_____   e) 163 _____153_____   f) 241 _____231_____

g) 450 _____440_____   h) 622 _____612_____   i) 310 _____300_____

Jump strategy

This strategy is demonstrated on a number line for both addition and subtraction.

$146 + 31 = 146 + 30 + 1 = 176 + 1 = 177$
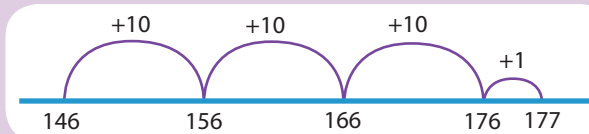
$175 - 23 = 175 - 20 - 3 = 155 - 3 = 152$

3 Solve each number sentence. Try using the jump strategy. Record your answers on the open number line.
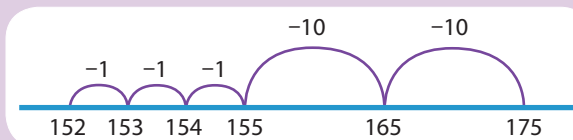
a) $137 + 21 =$

b) $168 + 15 =$

c) $148 - 23 =$

d) $181 - 56 =$

4 Tina wrote her solutions on an open number line using the jump strategy. What number sentences was she asked to solve?

Discuss with a partner how you solved the number sentences.

a)

_____$53 + 34 =$_____

b)

_____$194 - 38 =$_____

Open number lines

1 Skip count by 10 to complete each pattern.

a 23, 33, 43, __53__, __63__, __73__, __83__, __93__, __103__

b 147, 157, 167, __177__, __187__, __197__, __207__, __217__, __227__

2 Calculate the total run score after each batter's innings. Show your working on an open number line. The first one has been done for you.

Batter	Score	Working	Number sentence
1	78		
2	63	+60 +3 — 78 138 141	78 + 63 = 141
3	42	+40 +2 — 141 181 183	141 + 42 = 183
4	19	+10 +9 — 183 193 202	183 + 19 = 202
5	62	+60 +2 — 202 262 264	202 + 62 = 264
6	83	+80 +3 — 264 344 347	264 + 83 = 347
7	55	+50 +5 — 347 397 402	347 + 55 = 402
8	47	+40 +7 — 402 442 449	402 + 47 = 449
9	17	+10 +7 — 449 459 466	449 + 17 = 466
10	38	+30 +8 — 466 496 504	466 + 38 = 504
11	3	+3 — 504 507	504 + 3 = 507
Total score			507

Split strategy

1 How many tens are there in each number? The first one in each row has been done for you.

3

a 23 ___2___   **b** 91 ___9___   **c** 77 ___7___   **d** 40 ___4___

e 154 ___15___   **f** 185 ___18___   **g** 238 ___23___   **h** 522 ___52___
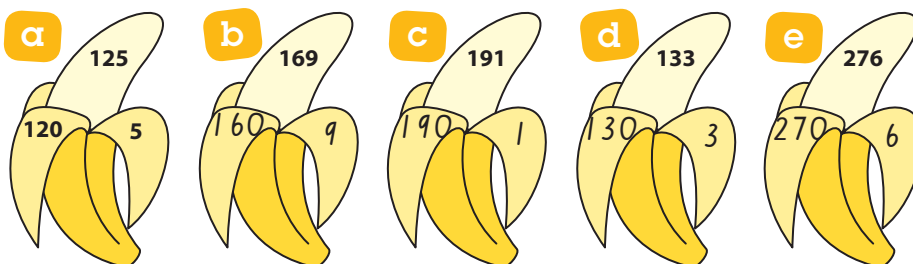
> **Split strategy**
>
> This is another way to add numbers easily.   132 + 47 =
>
> First split each number into tens and ones.   130 + 2 + 40 + 7
>
> Add the tens first and then the ones.   170 + 9 = 179

2 Split each number into tens and ones. The first one has been done for you.

a 125   **b** 169   **c** 191   **d** 133   **e** 276

120 5   160 9   190 1   130 3   270 6

3 Solve each number sentence. Try the split strategy.

a	123 + 14 =	120 + 3 + 10 + 4 = 137
b	156 + 21 =	150 + 6 + 20 + 1 = 177
c	162 + 35 =	160 + 2 + 30 + 5 = 197
d	158 + 26 =	150 + 8 + 20 + 6 = 184

Discuss with a partner how you solved the number sentences.

4 Add across and down to find the totals.
What strategies did you use? Write what you did.

71	58	129
63	87	150
134	145	

Answers will vary

Number and Place Value

Addition and subtraction problems

1 Add any two of these numbers in your head: 73   59   97   64

a _____ + _____ = _____

How did you work it out? *Answers will vary* _____

_____

b Subtract one of the above numbers from 110.

110 – _____ = _____

How did you work it out? *Answers will vary* _____

_____

2 Solve these problems. Check your answer with a calculator.

			Working out
a	Jon and Sofia went skiing. Jon's skis cost $125 to hire and Sofia's cost $87. How much did ski hire cost altogether?		*$212*
b	On a ski lift at Thredbo, there were 131 skiers. 24 of them were wearing goggles. How many were not wearing goggles?		*$107*
c	The depth of the snow was 218 cm. 34 cm of fresh snow fell overnight. What is the depth of snow now?		*252cm*
d	It costs $191 for a 3-day lift pass. If Ryan got a $55 discount, how much did he pay for the pass?		*$136*

3 Make up a subtraction problem about mountain bikes with an answer of 96.

Answers will vary _____

_____

_____

Discuss with a partner the strategies you used to solve these problems.

Number and Place Value   **9**

Order of addends

1 Circle pairs of numbers which add up to 10 to make these additions easier. Then do the additions. The first one has been done for you.

a ③+ 5 +⑦= ___15___ **b** ④+⑥+ 9 = ___19___ **c** 2 +⑨+① = ___12___

2 Circle pairs of numbers which add to 20 to make these additions easier. Then do the additions. The first one has been done for you.

a ⑪ +⑨+ 7 = ___27___ **b** ⑮ + 6 +⑤ = ___20___ **c** 4 +⑧+ ⑫ = ___24___

3 Write down pairs of numbers, from inside the stars, which add to 100.

56   10   71   44   33   67

45   6   29   94   55   90

___71,29___   ___55,45___   ___90,10___

___33,67___   ___94,6___   ___56,44___

4 Circle pairs of numbers which add to 100 to make these additions easier. Then do the additions. The first one has been done for you.

> This strategy involves changing the order of the *addends* (see p. 15) to find multiples of ten.

a ⑩ + 55 + ⑨⓪ = ___155___   **b** ⑥+ 17 + ⑨④ = ___117___

c 81 + ⑦① + ②⑨ = ___181___   **d** ④④ + ⑤⑥ + 31 = ___131___

5 Each sticky label is numbered.

63   30   4   121   17   37   9   151   21   25   80

a Which 2 have a sum of 100? ___63___ ___37___

b Which 2 have a difference of 100? ___121___ ___21___

c Which 2 have a sum close to 20? ___17___ ___4___

d Which 2 have a sum close to 200? ___121___ ___80___

What is the total of all numbers from 1 to 99?

e Use a calculator to find the total of all the numbers on the sticky labels. ___558___

Think of an easy way to add them.

Number links

1 Calculate the answer to each addition question using a mental strategy.

a 18 + 16 + 2 = _36_   **b** 20 + 30 + 80 = _130_   **c** 13 + 26 + 7 = _46_

d 2 + 17 + 43 = _62_   **e** 46 + 55 = _101_   **f** 109 + 19 = _128_

Explain how you worked out the answer to Question 1c.

Answers will vary _____

_____

2 Calculate the answer to each subtraction question using a mental strategy.

a 18 − 8 = _10_   **b** 35 − 21 = _14_   **c** 50 − 19 = _31_

d 20 − 7 − 3 = _10_   **e** 99 − 33 = _66_   **f** 106 − 11 = _95_

Explain how you worked out the answer to Question 2f.

Answers will vary _____

_____

3 Look at the grid. Link 2 numbers horizontally or vertically.

65	14	87
76	55	13
22	18	93

Discuss your strategies with a partner. Did you use the same strategies or different ones?

a Write down four links which total more than 100. The first one has been done for you. _76+55, 14 +87,_

_93+18, 65+76_

b Write down four links which total less than 100.

_18 +55, 22 +76, 22 +18, 14 +55_

c Write down one link that totals 100. _87 +13_

d What is the smallest total you can find? _40_

e What is the largest total you can find? _141_

Compensation strategy

1 Use the compensation strategy to complete the additions. The first one has been done for you.

> The compensation strategy can be used when you are adding.
>
> E.g. 45 + <u>39</u> = 45 + <u>40</u> subtract <u>1</u> = 84

a 54 + 18 = _54 + 20 subtract 2 = 72_

b 27 + 19 = _27 + 20 subtract 1 = 46_

c 36 + 29 = _36 + 30 subtract 1 = 65_

d 55 + 38 = _55 + 40 subtract 2 = 93_

2 Use the compensation strategy to complete the subtractions. The first one has been done for you.

> The compensation strategy can also be used when you are subtracting.
>
> E.g. 56 − <u>18</u> = 56 − <u>20</u> add <u>2</u> = 38

a 46 − 19 = _46 − 20 add 1 = 27_

b 57 − 19 = _57 − 20 add 1 = 38_

c 53 − 29 = _53 − 30 add 1 = 24_

d 75 − 38 = _75 − 40 add 2 = 37_

3 The following temperature forecasts have been made for different cities around the world.

Athens	Auckland	Cairo	Dubai	New York	Sydney
38°C	19°C	42°C	47°C	29°C	18°C

Calculate the difference in temperature between:

a Dubai and Auckland _28°C_

b Athens and New York _9°C_

c Cairo and Sydney _24°C_

4 Pretend the 8 key on your calculator is broken. Write how you could use your calculator to find the answer to this number sentence:

129 + 38 = _129 + 40 subtract 2 = 167_
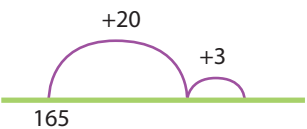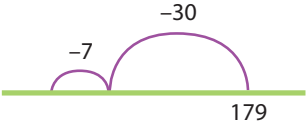
Can you think of any other ways? _Answers will vary_

Problem solving

1 Solve these addition and subtraction problems. Use a calculator to check your solution.

			Working out
a	On an overseas holiday, Ben took 138 photos in Bali and 127 in China. How many photos did he take altogether?		265
b	At the markets in Bali, Ben counted 186 stone and wood carvings. If 59 of the carvings were stone, how many were wood?		127
c	In China, Ben walked along the Great Wall. He walked up 216 steps, then took a rest. He climbed another 197 steps. How many steps did he climb altogether?		413
d	The island of Bali is 153 km wide. Ben's family drove from one side to the other. After driving 97 km, how much further did they have left to drive?		56

2 Write the number problem and answer for each calculation shown on the number line.

	Number line	Problem
a	+20, +3, 165	$165 + 20 + 3 = 188$
b	−30, −7, 179	$179 - 30 - 7 = 142$

Jasna saved $139 in January and $276 in February. How much more does she need to save in March to buy a digital camera worth $520?

MiB 2
Card 22

Number and Place Value **13**

Knowing the facts

> **Bridging the decades** is a strategy to solve addition and subtraction.
>
> E.g.   217 + 14 = ?   Think, ⟨217⟩ + 10 + ⟨3⟩ + 1   =   220 + 10 + 1
>
>   =   231

1 Explain how you could use the bridging strategy to solve these additions.

a 146 + 15 = _____ ⟨146⟩ + 10 + ⟨4⟩ + 1 = 161

b 208 + 26 = _____ ⟨208⟩ + 20 + 4 + ⟨2⟩ = 234

2 Try doing these in your head.

a 109 + 12 = __121__ **b** 158 + 15 = __173__ **c** 237 + 24 = __261__

> Using **patterns** is another strategy to solve addition and subtraction problems.
>
> E.g. 3 + 4 = 7, so 3 tens + 4 tens = 7 tens and 3 hundreds + 4 hundreds = 7 hundreds
>
>   30   +   40   =   70   and   300   +   400   =   700

3 Find the patterns.

5 + 3 = 8	50 + 30 = 80	500 + 300 = 800
8 − 1 = 7	80 − 10 = 70	800 − 100 = 700
6 + 7 = 13	60 + 70 = 130	600 + 700 = 1300
15 − 2 = 13	150 − 20 = 130	1500 − 200 = 1300
11 + 8 = 19	110 + 80 = 190	1100 + 800 = 1900

4 Solve these problems mentally.

Problem	Solution
a Greta has $50 and Ana has $70. How much do they have altogether?	$120
b Fiona has 1 bag of 140 beads and another of 80 beads. How many beads does she have altogether?	220
c Arin weighed 110 kg. He lost 30 kg. How heavy is he now?	80kg
d Jinu took 500 photos on his digital camera but deleted 300 of them. How many photos are left?	200

Can I give $110 to Karen, $130 to Pete and $160 to Emily, if I have $395? Explain your answer.

Number and Place Value

Estimation with addition

An **addend** is a number that is added to another number.

Numbers that end in 4 or less round down to the nearest ten. Numbers that end in 5 or more round up.

1 Estimate the answer by rounding each addend to the nearest ten, then calculate the answer. The first one has been done for you.

	Addition problem	Estimate	Answer
a	52 + 19 =	50 + 20 = 70	71
b	28 + 31 =	30 + 30 = 60	59
c	98 + 55 =	100 + 60 = 160	153

2 Estimate the answer by rounding each addend to the nearest hundred, then calculate the answer. The first one has been done for you.

Numbers that end in 49 or less round down to the nearest hundred. Numbers that end in 50 or more round up.

	Addition problem	Estimate	Answer
a	121 + 193 =	100 + 200 = 300	314
b	228 + 311 =	200 + 300 = 500	539
c	407 + 182 =	400 + 200 = 600	589
d	555 + 278 =	600 + 300 = 900	833

3 Estimate first, then calculate the answer.

	Problem	Picture	Estimate	Answer
a	In the piggy bank there are 114 gold coins and 183 silver coins. How many coins altogether?		300	297
b	Andrew swam 287 laps last week and 320 this week. How many laps did he swim altogether?		600	607
c	Write a problem and draw a picture for the answer shown. _Answers will vary_		200	176

Mental strategies

1 Circle the addition pairs with answers greater than 100.

12 + 80	(67 + 48)	(38 + 79)	(82 + 20)
45 + 45	90 + 7	(39 + 69)	(22 + 80)

2 Circle the addition pairs with answers greater than 1000.

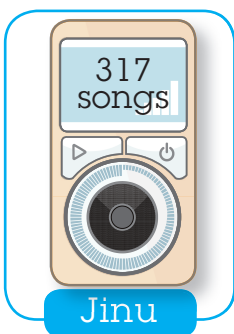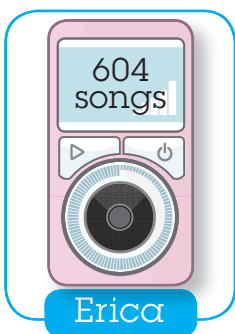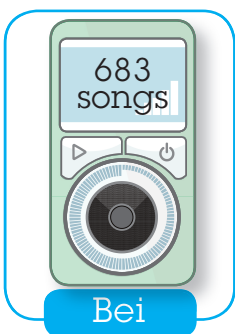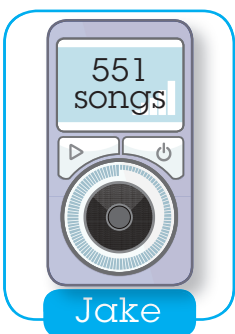|			
300 + 500	(900 + 150)	780 + 135	(550 + 528)
772 + 119	(347 + 723)	407 + 467	899 + 100

3

a Add any 2 of these numbers in your head.

349	199	251	217

How did you work it out? _Answers will vary_ _____

_____

b Subtract 1 of the above numbers from 400. 400 − _____ = _____

How did you work it out? _Answers will vary_ _____

_____

4 Look at each person's mp3 player below to see how many songs they have.

317 songs	604 songs	683 songs	551 songs	194 songs
Jinu	Erica	Bei	Jake	Tom

a How many songs do Erica and Tom have altogether? __798__

b Calculate the difference between
the number of songs Bei and Jake have. _____132_____

c Which 2 children have exactly
1000 songs between them? ____Jinu____ ____Bei____

d Use a calculator to calculate the total number
of songs that the 5 children have. _____2349_____

MiB 2
Card 22

16 Number and Place Value

Delivering goods

1

(20) (30) (40) (50) (60) (70)

a What do these signs tell us? _____ *speed limit* _____

b Mentally calculate the total of all the numbers on these signs.

_____ *270* _____

c Explain how you worked it out. *Answers will vary* _____

_____

d Can you do it another way? *Answers will vary* _____

These trucks have travelled great distances to deliver their goods.

1125 km	998 km	1257 km	632 km	864 km	530 km

2 Which coloured truck travelled:

a the greatest distance? __*white*__ **b** the least distance? __*black*__

3 What is the total distance travelled by:

a the green truck and the blue truck? _____ *1630* _____

b the yellow truck and the black truck? _____ *1655* _____

4 What is the difference in distance travelled by:

a the blue truck and the red truck? _____ *134* _____

b the white truck and the yellow truck? _____ *132* _____

5 Which 2 trucks together travelled:

a 2382 km? _____*yellow*_____ _____*white*_____

b 1162 km? _____*green*_____ _____*black*_____

What is the maximum legal speed limit for semi-trailers in the different states/territories of Australia?

The algorithm

1 Complete these addition algorithms. The first one has been done for you.

> An algorithm is a method used to calculate an answer. When using an algorithm to add and subtract, make sure that the numbers are placed in the correct columns according to their place value.

a

H	T	O
7	4	3
+ 1	5	2
8	9	5

b

H	T	O
3	4	5
+ 3	2	1
6	6	6

c

H	T	O
7	2	1
+ 1	7	7
8	9	8

d

H	T	O
5	3	8
+ 2	3	1
7	6	9

e

H	T	O
5	0	9
+ 2	8	0
7	8	9

2 **a** Complete these subtraction algorithms. The first one has been done for you.

i

H	T	O
7	8	9
− 1	6	2
6	2	7

ii

H	T	O
5	4	7
− 1	2	5
4	2	2

iii

H	T	O
6	0	2
− 3	0	1
3	0	1

iv

H	T	O
7	5	9
− 3	3	9
4	2	0

v

H	T	O
3	4	8
− 3	2	5
	2	3

b Check your answers in part **a** by completing the inverse operation of addition.

i

H	T	O
6	2	7
+ 1	6	2
7	8	9

ii

H	T	O
4	2	2
+ 1	2	5
5	4	7

iii

H	T	O
3	0	1
+ 3	0	1
6	0	2

3 Look at the table and write the number of crimes solved by:

a Banks and Sprigs ____673____

b Gleeson and Lawson ____368____

Agent	Number of crimes solved
Banks	631
Gleeson	53
Lawson	315
Sprigs	42

Trading in addition

Think and say!
8 ones plus 4 ones equals 12 ones. Trade 10 ones for 1 ten.
Record 2 in the ones column and 1 in the tens column.
2 tens plus 3 tens plus 1 ten equals 6 tens.
Record 6 in the tens column.
9 hundreds plus 5 hundreds equals 14 hundreds. Trade 10 hundreds for 1 thousand.
Record 4 in the hundreds column and 1 thousand in the thousands column.
4 thousand plus 2 thousand plus 1 thousand equals 7 thousands.
Record 7 in the thousands column.
Answer is 7462.

	Th	H	T	O
	¹4	9	¹2	8
+	2	5	3	4
	7	4	6	2

1 Solve these algorithms. The first one has been done for you.

a

	Th	H	T	O
	3	6	7	1
+	1	2	8	4
	4	9	5	5

b

	Th	H	T	O
	3	4	9	0
+	2	8	0	6
	6	2	9	6

c

	Th	H	T	O
	4	5	5	2
+	3	7	2	9
	8	2	8	1

d

	4	6	5	3
+		8	7	2
	5	5	2	5

e

	3	5	7	8
+	2	3	6	7
	5	9	4	5

f

	2	4	0	8
+	1	2	9	5
	3	7	0	1

2 Deepak plays his electronic game every night. He kept a record of his highest score each night.

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
392	1685	1776	3452	4076	4623	4918

a Calculate Deepak's total score for Thursday and Friday night.

$$+ \begin{array}{r} 3452 \\ 4076 \\ \hline 7528 \end{array}$$

b Calculate Deepak's total score for the weekend.

$$+ \begin{array}{r} 4623 \\ 4918 \\ \hline 9541 \end{array}$$

c Calculate Deepak's total for the week.

20 922

d Why do you think Deepak's scores went higher as the week went on?

improves scores by practising

MiB 2
Card 29

Number and Place Value 19

Trading in subtraction

Think and say!
6 ones take away 9 ones cannot be done.
Trade 1 ten from the tens column for 10 ones (5 tens becomes 4 tens).
Move the 10 ones to the ones column to make 16 ones.
16 ones take away 9 ones is 7 ones.
4 tens take away 1 ten is 3 tens.
8 hundreds take away 2 hundreds is 6 hundreds.
4 thousands take away 1 thousand is 3 thousands.
Answer is **3637**.

	Th	H	T	O
	4	8	⁴5̶	¹6
−	1	2	1	9
	3	6	3	7

1 Solve these algorithms. The first one has been done for you.

a

	Th	H	T	O
	5	⁵6̶	¹2	9
−	1	2	5	7
	4	3	7	2

b

	Th	H	T	O
	3	4	7	5
−	1	2	4	9
	2	2	2	6

c

	Th	H	T	O
	2	6	7	7
−	1	2	9	3
	1	3	8	4

d

	6	3	9	0
−		2	4	7
	6	1	4	3

e

	5	9	8	3
−	1	5	2	8
	4	4	5	5

f

	7	8	2	2
−	1	7	4	0
	6	0	8	2

2 The table shows the population of townships in New South Wales.

Township (NSW)	Bourke	Cooma	Hat Head	Huskisson	Wee Waa	Yass
Population	2840	7150	297	1612	2306	9675

Calculate the population difference between:

a Cooma and Bourke _____4310_____

b Yass and Wee Waa _____7369_____

c Huskisson and Hat Head _____1315_____

3 Which 2 townships have a combined population of 9456?

_____Cooma_____ _____Wee Waa_____

4 Todd completed this subtraction. Explain where he went wrong.

_____He incorrectly subtracted the 7_____

_____from the 9_____

	8	7	6	2
−	3	9	3	0
	5	2	3	2

Number and Place Value

Addition and subtraction of larger numbers

1 Find the sum of the following number sentences using a mental strategy.

a 540 + 230 = __770__   **b** 250 + 670 = __920__

c 1090 + 2400 = __3490__   **d** 1230 + 2700 = __3930__

e 5500 + 1500 = __7000__   **f** 3500 + 1510 = __5010__

2 Solve these algorithms.

a
```
  3 1 2 3 8
+ 2 4 9 6 1
-----------
  5 6 1 9 9
```

b
```
  5 6 3 0 9
+ 2 5 5 6 1
-----------
  8 1 8 7 0
```

c
```
  3 7 0 9 4
+   2 1 6 8
-----------
  3 9 2 6 3
```

d
```
  7 8 3 5 7
- 2 4 1 1 9
-----------
  5 4 2 3 8
```

e
```
  4 6 4 8 2
-   3 9 8 1
-----------
  4 2 5 0 1
```

f
```
  5 3 7 5 0
- 1 6 8 3 4
-----------
  3 6 9 1 6
```

3 The following table shows the number of bottles of water sold in each month of the year.

Jan	Feb	Mar	Apr	May	June
42 309	44 002	32 307	30 218	20 767	15 427

July	Aug	Sept	Oct	Nov	Dec
11 403	7879	13 872	19 623	27 654	36 401

a	Calculate the total number of bottles of water sold in February and March.	76309
b	How many more bottles of water were sold in May than June?	5340
c	Why do you think more bottles of water were sold in January than July?	It is summer in January
d	How many bottles of water were sold altogether in spring?	61149

In 11 523, the 5 digits add to 12. List other 5-digit numbers that add to 12.

5-digit problem solving

1 This table shows the amount of petrol (L) delivered to each service station by a tanker.

Gas Alley	Autofuel	Payless	Moto	EasyFuel	Biopump
25 196	27 481	25 518	33 491	30 016	28 122

Use a calculator to answer the following questions.

a What is the total amount of petrol delivered to Moto and Biopump?

_____61 613_____

b What is the difference between the amount of petrol delivered to EasyFuel and Payless?

_____4498_____

c Which two service stations have had a combined total of 50 714 L of petrol delivered? _____Gas Alley_____ _____Payless_____

2 Solve the following problems. Check your answers with a calculator.

		Problem	Working/solution
a		Dom bought a car for $28 890 and a caravan for $18 599. What was the total cost of his purchase?	$47 489
b		Jess's holiday cost $42 280 and Peta's cost $17 925. How much more did Jess pay than Peta for her holiday?	$24 355
c		Kath flew from Sydney to Hong Kong (7371 km) and then from Hong Kong to New York (13 033 km) to do some shopping. How far did Kath travel altogether?	20 404 km
d		At a recent netball match, the official attendance was 26 400. If the arena holds 50 000 spectators, how many more could have been admitted?	23 600

Multiplying by a multiple of ten

1 Choose 4 numbers between 0 and 9 and complete each multiplication square. Choose different sets of numbers each time. The first one has been done for you. *Answers will vary*

| 2 | 7 | 14 |
| 1 | 8 | 8 |

| 2 | 56 |

2 Mr Reddy asked his class to solve the multiplication 3 × 20. Some of the solutions are shown on the right. Match the student to the strategy.

a place value concepts ___Connor___

b repeated addition ___Kira___

c factors ___Tam___

Which strategy do you prefer to use?

Kira
3 × 20 = 20 + 20 + 20
= 60

Connor
3 × 20 = 3 × 2 tens
= 6 tens
= 60

Tam
3 × 20 = 3 × 2 × 10
= 6 × 10
= 60

3 Mr Reddy set up a cake stall to raise some money to buy games for his class.

Muffin 40 cents   Doughnut 30 cents   Cupcake 70 cents   Biscuit 50 cents

Use mental strategies to calculate the total cost (in cents) of the items in the table.

	Items	Cost	How did you work it out?
a	3 muffins	$1.20	Answers will vary
b	6 doughnuts	$1.80	
c	8 cupcakes	$5.60	
d	5 biscuits	$2.50	

Multiplication strategies

1 Draw a line to match the equivalent cards.

3 × 4	5 × 6	2 × 7	8 groups of 2	7 × 3

thirty	21	4 + 4 + 4	double 7	16

2 Mrs Thompson asked her class to solve the multiplication 9 × 13 =
Here are some of the solutions.

Stuart
9 × 13 = (9 × 10) + (9 × 3)
  = 90 + 27
  = 117

Chris
9 × 13, I know 10 × 13 = 130
So, 9 × 13   = 130 − 13
           = 117

Tilly
I know that 3 × 13 = 39
So, 9 × 13   = 3 × 39
           = 117

Show another way to work it out. _Answers will vary_

_____

3 Use mental strategies to solve these multiplications.

a 4 × 14 = _____ 56 _____

b 5 × 16 = _____ 80 _____

c 8 × 15 = _____ 120 _____

d 3 × 24 = _____ 72 _____

e 7 × 31 = _____ 217 _____

4 Different balls have different masses.

Golf ball 56 g   Squash ball 24 g   Tennis ball 61 g

Use mental strategies to calculate the total mass of the items in the table.

	Items	Total mass	How did you work it out?
a	3 golf balls	168g	_Answers will vary_
b	9 squash balls	216g	
c	4 tennis balls	244g	

2-digit multiplication

1 Complete these number sentences.

a $4 \times 6 =$ ___24___   b $7 \times 1 =$ ___7___   c $3 \times 3 =$ ___9___

d $2 \times 10 =$ ___20___   e $8 \times 2 =$ ___16___   f $6 \times 5 =$ ___30___

g $9 \times 3 =$ ___27___   h $10 \times 4 =$ ___40___   i   ___5___ $\times 2 = 10$

j   ___2___ $\times 3 = 6$ k $4 \times$ ___3___ $= 12$ l $5 \times$ ___10___ $= 50$

2 Look at the picture of the cake on the right and answer the questions below.

a   How many slices are in the cake? ___8___

b   Mentally calculate the number of slices in 6 cakes. ___48___

c   Mentally calculate the number of slices in 18 cakes. ___144___

d   Explain how you worked mentally to solve Question 2c.

Answers will vary _____

_____

e   If each slice is sold for $2, how much money would the baker make if he sold 18 cakes? ___$288___

f   The baker needs to make 336 slices. Use a calculator to work out how many cakes this is. ___42 cakes___

3 Each egg has a mass of 56 g. Mentally calculate the mass of each set of eggs.

a   b   c

___336g___   ___560g___   ___672g___

How could you use your answer from Question 3a to help you solve Question 3c?

MiB 2
Card 43

Number and Place Value   **25**

1 Fill in the table with multiplication facts.

×	9	2	8	1	4
2	18	4	16	2	8
7	63	14	56	7	28

2 Tim likes building, so he tried it with numbers. This is what he came up with.

Tim's multiplication facts

$3 \times 2 = 6$
$6 \times 2 = 12$
$12 \times 2 = 24$
$24 \times 2 = 48$

Tim's division facts

$6 \div 3 = 2$
$12 \div 3 = 4$
$24 \div 3 = 8$
$48 \div 3 = 16$

a Explain the strategy Tim used to build the multiplication facts.

Answers will vary

b Explain the strategy Tim used to build the division facts.

Answers will vary

c What is 48×2?   96   **d** What is $96 \div 3$?   32

3 Build multiplication facts to work out the costs in the table.

| Garlic bread $3	Pasta $7	Pizza $9
2 breads $2 \times 3 = 6$	3 pastas $3 \times 7 = 21$	5 pizzas $5 \times 9 = 45$
4 breads $4 \times 3 = 12$	6 pastas $6 \times 7 = 42$	10 pizzas $10 \times 9 = 90$
8 breads $8 \times 3 = 24$	12 pastas $12 \times 7 = 84$	20 pizzas $20 \times 9 = 180$
16 breads $16 \times 3 = 48$	24 pastas $24 \times 7 = 168$	40 pizzas $40 \times 9 = 360$

4 Gelato costs $5 for 3 scoops.

a How much will 9 scoops cost? $15

b How much will 27 scoops cost? $45

Egyptian multiplication

1 Draw lines to match the equivalent cards.

5 × 5	4 × 8	9 × 10	8 × 8	7 × 0

32	25	90	0	64
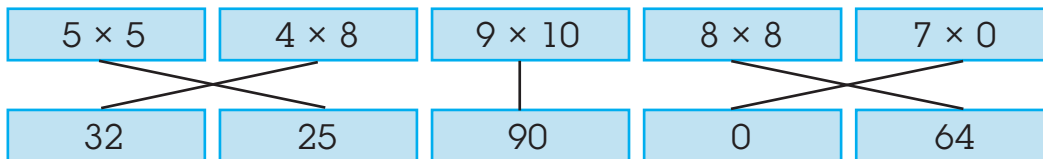
Ancient Egyptians had a different number system and did calculations in a different way. They used **doubling** to solve multiplication problems.

1 × 13 = 13
2 × 13 = 26
4 × 13 = 52
8 × 13 = 104

To calculate 5 × 13:

1 + 4 = 5,
so they added the answers to   1 × 13   and   4 × 13   to find   5 × 13.
                                    13   +   52   =   65

To calculate 11 × 13:

1 + 2 + 8 = 11,
so they added the answers to   1 × 13   and   2 × 13   and   8 × 13   to find   11 × 13.
                                13   +   26   +   104   =   143

2 Use the Egyptian method to solve these multiplications.

a 3 × 18

1 × 18 and 2 × 18 to find 3 × 18
18   +   36   =   54

b 5 × 18

1 × 18 and 4 × 18 to find 5 × 18
18   +   72   =   90

c 15 × 18

1 × 18 and 2 × 18 and 4 × 18 and 8 × 18 to find 15 × 18
18   +   36   +   72   +   144   =   270

Make up your own 2-digit multiplications and give to a friend to solve.

MiB 2
Card 45

Number and Place Value   **27**

Division strategies

1 Write the related multiplication (×) and division (÷) facts for each triangle. The first one has been done for you.

18 △ 3 6	10 △ 2 5	28 △ ? 7	45 △ 5 ?	80 △ 8 ?
3 × 6 = 18	2 × 5 = 10	4 × 7 = 28	5 × 9 = 45	8 × 10 = 80
6 × 3 = 18	5 × 2 = 10	7 × 4 = 28	9 × 5 = 45	10 × 8 = 80
18 ÷ 6 = 3	10 ÷ 5 = 2	28 ÷ 4 = 7	45 ÷ 9 = 5	80 ÷ 8 = 10
18 ÷ 3 = 6	10 ÷ 2 = 5	28 ÷ 7 = 4	45 ÷ 5 = 9	80 ÷ 10 = 8

2 Work out the cost for one of each item.

a Sushi 4 for $8	b Strawberries 5 for 50c	c Ice-creams 3 for $18	d Biscuits 6 for 54c
1 sushi costs ___$2___	1 strawberry costs ___10¢___	1 cone costs ___$6___	1 biscuit costs ___9¢___

3 Look for a pattern to solve these divisions. The first one has been done for you.

a 12 ÷ 4 = 3 so 120 ÷ 4 = ___30___

b 20 ÷ 5 = 4 so 200 ÷ 5 = ___40___

c 28 ÷ 4 = 7 so 280 ÷ 4 = ___70___

d 15 ÷ 3 = ___5___ so 150 ÷ 3 = ___50___

e Gulzar had $320 and shared it equally between his 4 children. How much did each child get? ___$80___

f Kasey swam 490 laps in one week. If she swam the same number of laps each day, how many laps did she swim in one day? ___70 laps___

4 Use a calculator to find how many times:

a 13 can be subtracted from 104? ___8___ So, 104 ÷ 13 = ___8___

b 18 can be subtracted from 126? ___7___ So, 126 ÷ 18 = ___7___

28 Number and Place Value

Division problems

1   Write the answers to these division statements.

a $32 \div 4 = \underline{\quad 8 \quad}$ b $24 \div 4 = \underline{\quad 6 \quad}$

c $18 \div 3 = \underline{\quad 6 \quad}$ d $30 \div 3 = \underline{\quad 10 \quad}$

e $8 \div 1 = \underline{\quad 8 \quad}$ f $35 \div 5 = \underline{\quad 7 \quad}$

g $15 \div 5 = \underline{\quad 3 \quad}$ h $27 \div 3 = \underline{\quad 9 \quad}$

i $16 \div 4 = \underline{\quad 4 \quad}$ j $42 \div 7 = \underline{\quad 6 \quad}$

2   Work out the answer and record the strategy you used for these division problems.

		Problem	Working out/strategy
a		Share 16 masks among 4 children.	$16 \div 4 = 4$
b		Share 21 flowers among 3 vases.	$21 \div 3 = 7$
c		Share 30 shells among 5 buckets.	$30 \div 5 = 6$
d		Share 48 fish among 8 tanks.	$48 \div 8 = 6$

3   Write your own division problem which has an answer of:

a   4   *Answers will vary* _____

_____

b   7   *Answers will vary* _____

_____

4   This cup contains 24 Easter eggs. Show 6 ways that these eggs could be shared.

$24 \div \underline{\quad 3 \quad} = \underline{\quad 8 \quad}$ $24 \div \underline{\quad 6 \quad} = \underline{\quad 4 \quad}$

$24 \div \underline{\quad 8 \quad} = \underline{\quad 3 \quad}$ $24 \div \underline{\quad 12 \quad} = \underline{\quad 2 \quad}$

$24 \div \underline{\quad 4 \quad} = \underline{\quad 6 \quad}$ $24 \div \underline{\quad 2 \quad} = \underline{\quad 12 \quad}$

Number and Place Value   **29**

Linking division and multiplication

1 If you start from 0 and count by fours, which of these numbers are counted? Circle these numbers.

(12)   17   22   (24)   (28)   34   38   (40)

> If the number you are dividing is not a multiple of the number you are dividing by, then there will be a remainder.

2 Tick whether or not there will be a remainder. The first one has been done for you.

	Division statements	Remainder	No remainder
a	13 ÷ 4	✓	
b	14 ÷ 7		✓
c	16 ÷ 4		✓
d	22 ÷ 5	✓	
e	18 ÷ 6		✓
f	26 ÷ 6	✓	

> Multiplication can be used to solve division. E.g. 26 ÷ 6
>
> Think, 4 × 6 = 24 and 2 more makes 26. So, 26 ÷ 6 = 4 r 2.

3 Solve these divisions, then check your answer using multiplication. The first one has been done for you.

a	11 ÷ 3 =	$3 × 3 = 9$ $9 + 2 = 11$
b	18 ÷ 4 =	$4 × 4 = 16$ $16 + 2 = 18$
c	28 ÷ 5 =	$5 × 5 = 25$ $25 + 3 = 28$
d	41 ÷ 6 =	$6 × 6 = 36$ $36 + 5 = 41$

4 At Wonderworld Theme Park, the Runaway Train can hold 6 children.

a How many trains would be needed for 29 children? _____5_____

Explain your answer. _____ 4 trains will only carry 24 children an additional train is required _____

b Estimate how many trains would be needed for 595 children. _____100_____ Check your answer on a calculator.

_____99.17_____ Was your estimate reasonable? _____Yes_____

Multiplication costs

1 In each of these number facts the signs (×, ÷ or =) have been stolen. Get them back and put them in their proper places. The first one has been done for you.

12	÷	3	=	4	3	×	5	=	15	3	×	11	=	33
9	×	8	=	72	42	÷	6	=	7	25	÷	5	=	5
3	×	10	=	30	32	÷	2	=	16	7	×	7	=	49

2 Use a mental strategy to calculate the cost of the phone calls, using the rates in the table.

Country	Rate per minute
Afghanistan	56c
Fiji	41c
India	57c
Ireland	17c
Kenya	74c
New Zealand	13c
Vietnam	36c

a 3-minute call to Ireland   _51¢_

b 6-minute call to Vietnam   _$2.16_

c 4-minute call to India   _$2.28_

d 7-minute call to Kenya   _$5.18_

e Is it cheaper to make a 6-minute call to Fiji or a 7-minute call to Vietnam? Explain your answer.

Fiji: 6 × 41¢ = $2.46 → Cheaper to make a call to fiji

Vietnam: 7 × 36¢ = $2.52

3 Use a calculator and repeated subtraction to calculate how many minutes you can call Afghanistan for $6.72. (Remember $6.72 = 672c).

12 minutes

4 In 2008, Australia Post charged customers the following rates for post to Indonesia. Use a calculator to find the total cost of sending three 40 g parcels, five 100 g parcels and six 400 g parcels to Indonesia.

Size of letter	Cost
Up to 50 g	$1.35
Over 50 g up to 125 g	$2.70
Over 125 g up to 250 g	$3.95
Over 250 g up to 500 g	$7.95

_$65.25_

MiB 2
Card 47

Number and Place Value 31

Multiplication and division problems

1 Look at each problem in the table. Is it multiplication or division? Work out the answer and record the strategy you used. The first one has been done for you.

		Problem	Working out/ strategy
a		At Outback Jail there are 7 prisoners in each cell. If there are 140 prisoners, how many cells are there?	*I know that,* $14 \div 7 = 2$ *so,* $140 \div 7 = 20.$
b		The police force caught 14 speeding drivers every hour for 6 hours. How many drivers were caught speeding altogether?	*84*
c		80 cars were stolen from a car park last week and all their wheels were sold. How many wheels were sold in total?	*320*
d		Detective Donald found 8 bags containing stolen goods. Inside each bag he found 27 mobile phones. How many mobile phones were stolen?	*216*
e		4 detectives collected a total of 96 pieces of evidence at a crime scene. How many pieces did each detective collect if they all collected the same amount?	*24*

2 Write and then solve a word problem for each number sentence.

a $22 \times 4 =$ _____ *88*

_____

b $31 \times 7 =$ _____ *217*

_____

c $42 \div 6 =$ _____ *7*

_____

Factors

A factor is a whole number that divides another number evenly, leaving no remainder.

e.g. $6 \div 3 = 2$

3 is a factor of 6. Other factors of 6 are 1, 2 and 6.

1 Complete this multiplication grid.

×	9	4	3	7	6	10
2	18	8	6	14	12	20
5	45	20	15	35	30	50
8	72	32	24	56	48	80

2 Use the arrays to help find all the factors.

a 12

_1, 2, 3, 4, 6, 12_

b 20

_1, 2, 4, 5, 10, 20_

3 Circle the jewels which are factors of the number on each treasure box.

a

22 1 7 8
32 **32** 3
2 18
4 28
9 16

b

4 5 13
9 **45** 1
10 0
15 45
7 3

4
a Write down all the factors of 20. _1, 2, 4, 5, 10, 20_

b Write down all the factors of 40. _1, 2, 4, 5, 8, 10, 20, 40_

c What do you notice about the factors of 20 and 40?

They overlap

Factors and products

The **product** is the result when 2 or more numbers are multiplied.

1 Complete these factor tables.

Factor	2	5	8	7	9	10
Factor	3	6	3	8	4	6
Product	6	30	24	56	36	60

Product	12	18	27	25	63	80
Factor	6	3	9	5	7	10
Factor	72	54	243	125	441	800

2 List all the factors for these numbers, then write them in ascending order.

	Number	Multiplication number sentences	Factors
a	8	1×8, 2×4	1, 2, 4, and 8
b	15	1×15, 3×5	1, 3, 5 and 15
c	21	1×21, 3×7	1, 3, 7 and 21
d	16	1×16, 4×4, 8×2	1, 2, 4, 8 and 16

3 Bruce helped construct a building which has 60 windows on each floor.

a List all the factors of 60. $\underline{1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60}$

b Write as many multiplication number sentences as you can using the factors of 60.

$\underline{1 \times 60, 2 \times 30, 3 \times 20, 4 \times 15, 5 \times 12, 6 \times 10}$

c Write as many division number sentences as you can using the factors of 60.

$\underline{60 \div 1, 60 \div 2, 60 \div 3, 60 \div 4, 60 \div 5, 60 \div 6, 60 \div 10, 60 \div 12, 60 \div 15,}$

$\underline{60 \div 20, 60 \div 30, 60 \div 60,}$

d The building is 18 storeys high. How many windows are there in the entire building?

$\underline{1080 \quad windows}$

Which number between 1 and 100 has the most factors? **Hint:** It will be an even number. You may use a calculator.

34 **Number and Place Value**

Fun with factors

1 Mr Bonnor decided to play 'Number Heads' with his class. He stuck a number on each student's forehead and each student had to ask questions to find out what number they had. Tito and Connie asked the following questions. Can you work out what number each of them had? Cross the numbers off the chart to help you.

Hint: You can cross off the odd numbers.

Tito

Am I an even number? Yes

Am I a factor of 48? No

Am I a multiple of 10? Yes

Am I a factor of 40? No

Am I larger than 40? No

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	(30)
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

Connie

Am I a factor of 24? No

Am I a multiple of 5? No

Am I a factor of 21? Yes

Am I a multiple of 3? Yes

Do I have 2 digits? Yes

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
(21)	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

2 Choose a number between 1 and 50. Write your own set of clues to eliminate numbers until you have just your number left. Use the number chart to help you.

Answers will vary

_____

_____

_____

_____

_____

_____

_____

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

Equivalent fractions – halves, quarters and eighths

1 **a** Make equivalent fractions like those in the table below by folding 4 paper strips.

							1 whole
			$\frac{1}{2}$				$\frac{2}{2}$
	$\frac{1}{4}$		$\frac{2}{4}$		$\frac{3}{4}$		$\frac{4}{4}$
$\frac{1}{8}$	$\frac{2}{8}$	$\frac{3}{8}$	$\frac{4}{8}$	$\frac{5}{8}$	$\frac{6}{8}$	$\frac{7}{8}$	$\frac{8}{8}$

b Put these fractions onto the shirts hanging on the line to show their order.

$\frac{1}{4}$, $\frac{1}{8}$, $\frac{7}{8}$, $\frac{1}{2}$, $\frac{3}{4}$

0 $\frac{1}{8}$ $\frac{1}{4}$ $\frac{1}{2}$ $\frac{3}{4}$ $\frac{7}{8}$ 1
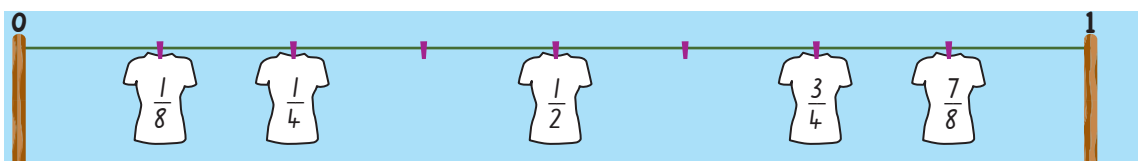
c Which other fractions are equivalent to:

i $\frac{1}{4}$ _____ $\frac{2}{8}$ _____

ii $\frac{6}{8}$ _____ $\frac{3}{4}$ _____

iii $\frac{1}{2}$ ___ $\frac{2}{4}$ ___ , ___ $\frac{4}{8}$ ___

iv $\frac{4}{4}$ ___ $\frac{2}{2}$ ___ , ___ $\frac{8}{8}$ ___

2 Colour the larger in each pair.

a $\frac{1}{4}$ $\frac{3}{8}$ **b** $\frac{1}{2}$ $\frac{3}{8}$ **c** $\frac{5}{8}$ $\frac{3}{4}$

3 $\frac{4}{8}$ $\frac{1}{4}$ $\frac{2}{2}$ $\frac{7}{8}$
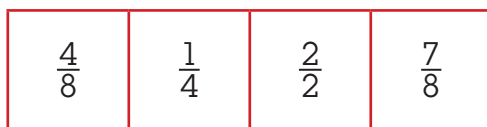
a Order the fractions from smallest to largest. ___ $\frac{1}{4}, \frac{4}{8}, \frac{7}{8}, \frac{2}{2}$ ___

b Place these 4 fractions on the number line.

0 ———————————————— 1

$\frac{1}{4}$ $\frac{4}{8}$ $\frac{7}{8}$ $\frac{2}{2}$
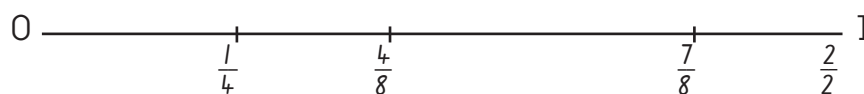
4 Look at the table in Question 1 to help you name a fraction between:

a $\frac{1}{4}$ and $\frac{1}{2}$ ___ $\frac{3}{8}$ ___

b $\frac{1}{2}$ and $\frac{3}{4}$ ___ $\frac{5}{8}$ ___

c $\frac{3}{4}$ and 1 ___ $\frac{7}{8}$ ___

d 0 and $\frac{1}{4}$ ___ $\frac{1}{8}$ ___

Mixed numerals

I whole and $\frac{1}{2} = 1\frac{1}{2}$. This is called a **mixed numeral**.

Look at the shaded squares here to the right.
I whole square is shaded and $\frac{1}{2}$ of the other square is shaded. So, $1\frac{1}{2}$ squares are shaded.
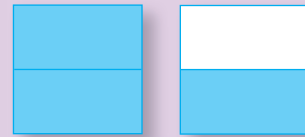
1 Name each mixed numeral shown by the coloured squares below.

a

$1\frac{1}{4}$

b

$1\frac{3}{4}$

c

$2\frac{1}{2}$

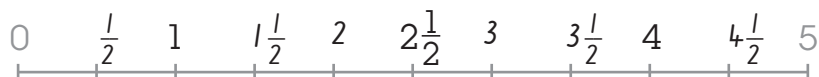**2** Write these fractions onto the stars to show their order.

1 , $1\frac{1}{2}$, $\frac{1}{2}$

0   2

$\frac{1}{2}$ 1 $1\frac{1}{2}$

3 Write these fractions onto the diamonds to show their position.

$\frac{3}{4}$, $1\frac{1}{4}$, $\frac{2}{4}$, $1\frac{3}{4}$, $\frac{1}{4}$, $1\frac{2}{4}$

0   1   2

$\frac{1}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $1\frac{1}{4}$ $1\frac{2}{4}$ $1\frac{3}{4}$

Colour the larger numeral in each pair.

a $\frac{3}{4}$ $1\frac{1}{2}$

b $1\frac{3}{4}$ 1

c $2\frac{1}{4}$ $1\frac{3}{4}$

4 a Fill in the missing fractions.

0   $\frac{1}{2}$ 1 $1\frac{1}{2}$ 2 $2\frac{1}{2}$ 3 $3\frac{1}{2}$ 4 $4\frac{1}{2}$ 5

b Count by quarters and fill in the grid.

| $\frac{1}{4}$ | $\frac{2}{4}$ | $\frac{3}{4}$ | 1 | $1\frac{1}{4}$ | $1\frac{1}{2}$ | $1\frac{3}{4}$ | 2 | $2\frac{1}{4}$ | $2\frac{1}{2}$ | $2\frac{3}{4}$ | 3 | $3\frac{1}{4}$ | $3\frac{1}{2}$ | $3\frac{3}{4}$ | 4 |

Equivalent fractions – fifths, tenths and hundredths

1 Make equivalent fractions like those in the table below by folding 3 paper strips.

									1 whole
$\frac{1}{5}$		$\frac{2}{5}$		$\frac{3}{5}$		$\frac{4}{5}$		$\frac{5}{5}$	
$\frac{1}{10}$	$\frac{2}{10}$	$\frac{3}{10}$	$\frac{4}{10}$	$\frac{5}{10}$	$\frac{6}{10}$	$\frac{7}{10}$	$\frac{8}{10}$	$\frac{9}{10}$	$\frac{10}{10}$

2 Write these fractions onto the lights to show their order.

$\frac{3}{10}$, $\frac{6}{10}$, $\frac{1}{10}$, $\frac{5}{10}$, $\frac{4}{10}$
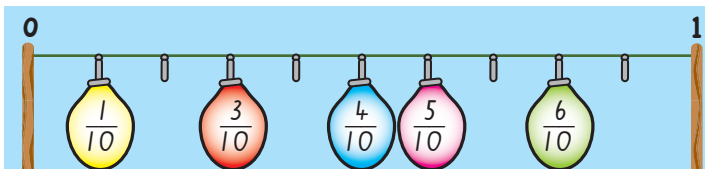
3 Order the fractions from smallest to largest in each row.

a

$\frac{2}{5}$	$\frac{4}{5}$	$\frac{1}{5}$	$\frac{3}{5}$

$\frac{1}{5}$, $\frac{2}{5}$, $\frac{3}{5}$, $\frac{4}{5}$

b

$\frac{1}{10}$	$\frac{6}{10}$	1	$\frac{3}{10}$

$\frac{1}{10}$, $\frac{3}{10}$, $\frac{6}{10}$, 1

c

$\frac{1}{5}$	$\frac{4}{10}$	$\frac{1}{10}$	$\frac{3}{5}$

$\frac{1}{10}$, $\frac{1}{5}$, $\frac{4}{10}$, $\frac{3}{5}$

4 Colour part of the bottom rectangle to make it equivalent to the top, then write the equivalent fraction. The first one has been done for you.

a

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

b

$\frac{4}{5}$ = $\frac{8}{10}$

c
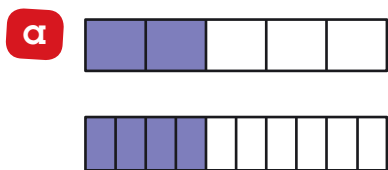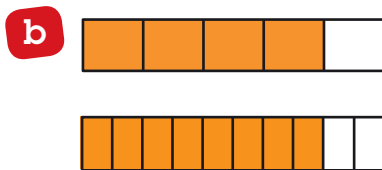
$\frac{1}{5}$ = $\frac{2}{10}$
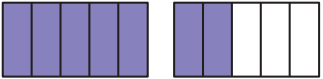
5 The hundreds square shows that $\frac{40}{100}$ is equivalent to $\frac{4}{10}$. Draw lines between the equivalent fractions to match them in the same way.
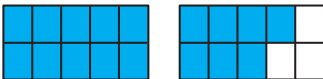

$\frac{10}{100}$	$\frac{3}{10}$
$\frac{30}{100}$	$\frac{10}{10}$
$\frac{60}{100}$	$\frac{1}{10}$
$\frac{100}{100}$	$\frac{6}{10}$

38 Fractions and Decimals
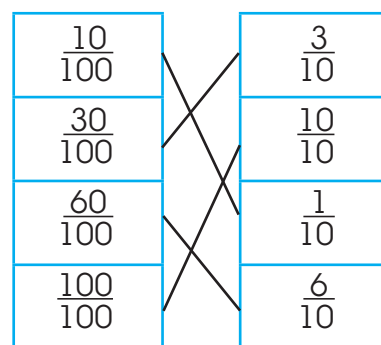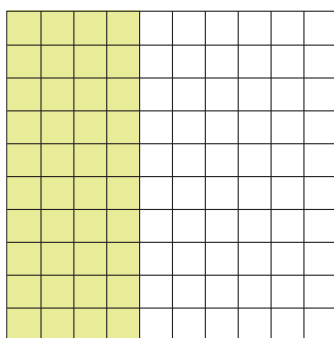
More mixed numerals

1 Write the mixed numeral for each. The first one has been done for you.

a ___1___ whole and ___2___ fifths or ___$1\frac{2}{5}$___

b ___1___ whole and ___4___ fifths or ___$1\frac{4}{5}$___

c ___2___ whole and ___3___ fifths or ___$1\frac{3}{5}$___

d ___1___ whole and ___7___ tenths or ___$1\frac{7}{10}$___

2 Put these fractions onto the Chinese lanterns to show their order.
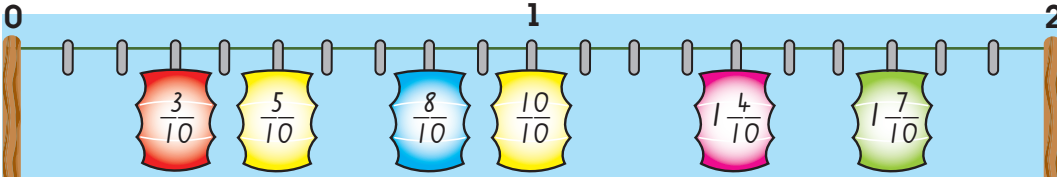
a

$1\frac{2}{5}$	$\frac{1}{5}$	$\frac{5}{5}$	$1\frac{3}{5}$	$\frac{3}{5}$

b

$\frac{5}{10}$	$1\frac{7}{10}$	$\frac{10}{10}$	$\frac{3}{10}$	$\frac{8}{10}$	$1\frac{4}{10}$

3 Colour the larger fraction in each pair.

a $1\frac{5}{10}$ $\frac{9}{10}$ **b** $1\frac{2}{5}$ $1\frac{4}{10}$ **c** $\frac{8}{10}$ $1\frac{4}{10}$

4 **a** Fill in the missing fractions.

0   $\frac{1}{5}$ $\frac{2}{5}$ $\frac{3}{5}$ $\frac{4}{5}$ $\frac{5}{5}$ $1\frac{1}{5}$ $1\frac{2}{5}$ $1\frac{3}{5}$ $1\frac{4}{5}$ 2 $2\frac{1}{5}$ $2\frac{2}{5}$ $2\frac{3}{5}$ $2\frac{4}{5}$ 3
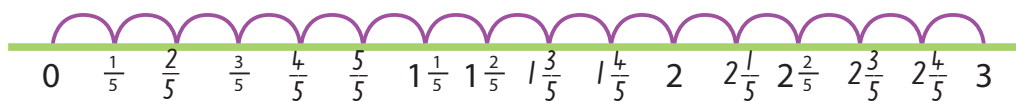
b Count by tenths and fill in the grid.

$\frac{1}{10}$	$\frac{2}{10}$	$\frac{3}{10}$	$\frac{4}{10}$	$\frac{5}{10}$	$\frac{6}{10}$	$\frac{7}{10}$	$\frac{8}{10}$	$\frac{9}{10}$	1	$1\frac{1}{10}$	$1\frac{2}{10}$	$1\frac{3}{10}$	$1\frac{4}{10}$	$1\frac{5}{10}$	$1\frac{6}{10}$
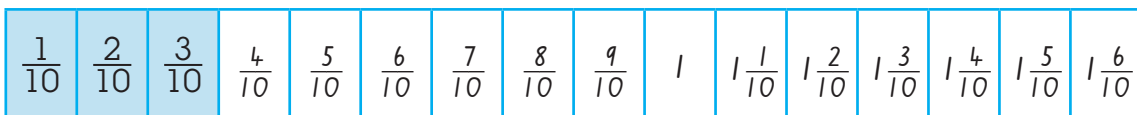
Thirds and sixths

1 Make equivalent fractions like those in the table below by folding three paper strips.

🔥 **9**

1 whole					
$\frac{1}{3}$		$\frac{2}{3}$		$\frac{3}{3}$	
$\frac{1}{6}$	$\frac{2}{6}$	$\frac{3}{6}$	$\frac{4}{6}$	$\frac{5}{6}$	$\frac{6}{6}$

2 Name a fraction equivalent to:

a $\frac{2}{6}$ _____$\frac{1}{3}$_____   **b** $\frac{2}{3}$ _____$\frac{4}{6}$_____   **c** 1 _____$\frac{3}{3}$_____

3 Colour the larger in each pair.

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

4 Count by thirds and fill in the grid.

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

5 Does $\frac{3}{6} = \frac{1}{2}$? _____Yes_____ Explain how you know. _____

_____They are equivalent fractions_____

6 a Design a flag that is $\frac{1}{3}$ red, $\frac{1}{3}$ green, $\frac{1}{6}$ yellow and $\frac{1}{6}$ blue.

b Design a pizza that is $\frac{1}{2}$ salami, $\frac{1}{6}$ mushroom, $\frac{1}{6}$ cheese and $\frac{1}{6}$ olives.
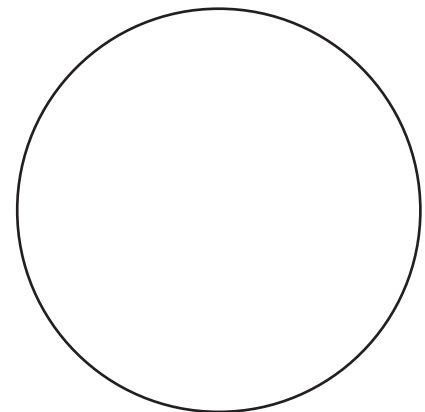
Converting mixed numerals to improper fractions

An improper fraction is a fraction that has a numerator larger than or equal to its denominator. A proper fraction is a fraction with the numerator smaller than the denominator.

1 Sort these fractions into these three groups: improper fractions, proper fractions and mixed numerals.

$\frac{3}{4}$	$3\frac{1}{2}$	$\frac{3}{3}$	$1\frac{1}{4}$	$4\frac{2}{3}$	$\frac{5}{4}$	$\frac{7}{2}$	$\frac{5}{6}$	$\frac{7}{10}$

Improper fractions	Proper fractions	Mixed numerals
$\frac{5}{4}$ $\frac{3}{3}$ $\frac{7}{2}$	$\frac{3}{4}$ $\frac{5}{6}$ $\frac{7}{10}$	$3\frac{1}{2}$ $1\frac{1}{4}$ $4\frac{2}{3}$

2 A mixed numeral can be converted into an improper fraction.

$$1\frac{1}{4} = \frac{4}{4} + \frac{1}{4} = \frac{5}{4}$$

Convert these mixed numerals into improper fractions.

a $1\frac{4}{5} = $ _____ $\frac{9}{5}$

b $1\frac{1}{2} = $ _____ $\frac{3}{2}$

c $1\frac{3}{10} = $ _____ $\frac{13}{10}$

d $2\frac{1}{5} = $ _____ $\frac{11}{5}$

3 Convert these improper fractions into mixed numerals.

a $\frac{4}{3}$ _____ $1\frac{1}{3}$ **b** $\frac{7}{4}$ _____ $1\frac{3}{4}$ **c** $\frac{5}{3}$ _____ $1\frac{2}{3}$

d $\frac{5}{2}$ _____ $2\frac{1}{2}$ **e** $\frac{9}{4}$ _____ $2\frac{1}{4}$ **f** $\frac{14}{5}$ _____ $2\frac{4}{5}$

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Decimals – tenths

1 This decimal tower shows the decimal 2.6.
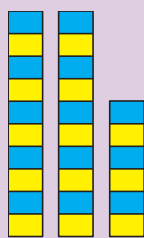
Ones	.	Tenths
2	.	6

The place value of the 2 is ones and the 6 is tenths.

a Make decimal towers for:

i 4.1   **ii** 5.3   **iii** 2.8
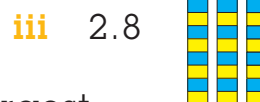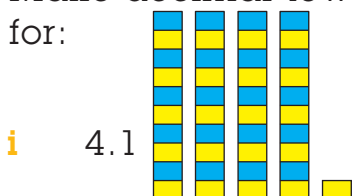
b Order these decimals from smallest to largest.

2.8, 4.1, 5.3

c Fill in the place values for each decimal in Question 1a.

i
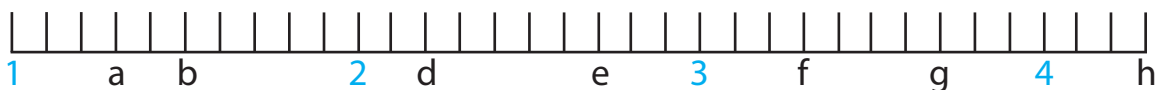| Ones	.	Tenths
4	.	1

ii
Ones	.	Tenths
5	.	3

iii
Ones	.	Tenths
2	.	8

2 Name the decimal on the number line.

1 a b   2 d   e 3 f   g 4 h
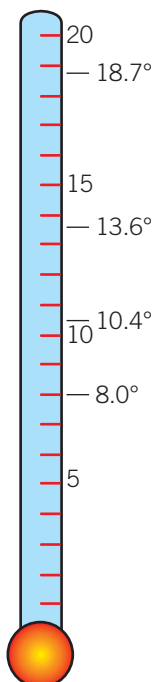
a 1.3   **b** 1.5   **c** 1.8   **d** 2.2

e 2.7   **f** 3.3   **g** 3.7   **h** 4.3

3 This table shows the qualifying times for the six fastest drivers. What position will each driver start in?
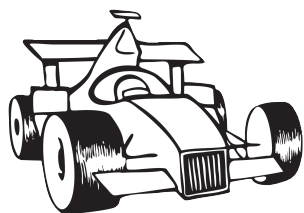
Driver	Time (secs)	Position
Chris	25.6	2
Tran	31.1	6
Ali	27.2	3
Pele	30.8	5
Moto	24.9	1
Joon	27.7	4

4 Place these temperatures on the thermometer: 5.5°C, 13.6°C, 10.4°C, 18.7°C, 8.0°C.

Thermometer markings: 20, 18.7°, 15, 13.6°, 10.4°, 10, 8.0°, 5

Decimals – hundredths

The place value of the 6 is ones, the 3 is tenths and the 9 is hundredths.

Ones	.	Tenths	Hundredths
6	.	3	9

1 Name each decimal on the number line.

1.60 ___ a ___ b ___ c 1.70 ___ d ___ e ___ f 1.80

🔥 10

a	b	c	d	e	f
1.63	1.66	1.69	1.72	1.76	1.79

Answers will vary

2 Order the prices of the items from cheapest to most expensive.

Slinky $7.95 — 3	Viking hat $8.50 — 5	Beach ball $6.75 — 2
Whistle $3.20 — 1	Finger puppets $9.95 — 6	Funny teeth $8.35 — 4

3 The table shows ten record times for the women's 50 m freestyle.

Order	Name	Time (secs)
8	Anne	25.64
7	Dara	25.61
3	Inge	24.13
9	Jill	25.79
4	Jingyi	24.51
10	Kelly	26.53
1	Libby	23.97
2	Marleen	24.09
6	Tamara	25.28
5	Wenyi	24.79

The faster the time, the smaller the number is.

a Order the times from fastest (1) to slowest (10) on the table.

b Which swimmer has the:
i fastest time? ___Libby___
ii slowest time? ___Kelly___

c i Jill has a [slower] faster time than Inge.
ii Dara has a [slower] faster time than Marleen.
iii Jingyi has a slower [faster] time than Wenyi.

d What is the difference between the fastest and slowest times? ___2.56 seconds___

e By how much did Libby beat the time of 24.00 secs?
___0.03 seconds___

MiB 2 Cards 56, 57 & 58

Fractions and Decimals **43**

Rounding decimals

1 Place these decimals on the number line: 0.6, 1.2, 2.3, 2.9, 3.5, 3.9.

| 0 | 0.6 | 1 | 1.2 | 2 | 2.3 | 2.9 3 | 3.5 | 3.9 4 |

2 Write the decimals to the nearest whole number.

a 0.6 _____1_____ **b** 1.2 _____1_____ **c** 2.3 _____2_____ **d** 2.9 _____3_____ **e** 3.5 _____4_____ **f** 3.9 _____4_____

3 Round each minimum and maximum temperature to the nearest whole degree. The first one has been done for you.

	Adelaide	Brisbane	Darwin	Hobart	Melbourne	Perth	Sydney
Minimum temperature	12.6°C	18.2°C	19.9°C	3.8°C	8.3°C	12.7°C	9.2°C
Rounding	13°C	18°C	20°C	4°C	8°C	13°C	9°C
Maximum temperature	22.7°C	28.8°C	32.1°C	15.0°C	20.2°C	25.6°C	21.7°C
Rounding	23°C	29°C	32°C	15°C	20°C	26°C	22°C

4 Round these numbers to the nearest whole number.

a 2.34 _____2_____   **b** 4.81 _____5_____   **c** 7.73 _____8_____

d 9.56 _____10_____   **e** 12.17 _____12_____   **f** 20.09 _____20_____

5 Round each item on the menu to the nearest dollar.

$12.70	$8.25	$6.95	$11.50	$15.45
$ ___13___	$ ___8___	$ ___7___	$ ___12___	$ ___15___

MiB 2 Card 60

Write five amounts that rounded to the nearest dollar would be $10.

44 **Fractions and Decimals**

Multiplying and dividing decimals

1 **a** Use a calculator to multiply each decimal by 10 and 100.

	1.34	7.83	12.52	16.33	32.76	49.08
× 10	13.4	78.3	125.2	163.3	327.6	490.8
× 100	134	783	1252	1633	3276	4908

b Describe your findings. _The decimal point moves right_

2 **a** Use a calculator to divide each decimal by 10 and 100.

	2.81	7.93	15.52	22.18	41.06	50.28
÷ 10	0.281	0.793	1.552	2.218	4.106	5.028
÷ 100	0.0281	0.0793	0.1552	0.2218	0.4106	0.5028

b Describe your findings. _The decimal point moves left_

3 How many 10 cent pieces make up these amounts?

a 80c _____8_____   **b** 130c _____13_____

c $7.50 _____75_____   **d** $12.30 _____123_____

4 How many $100 notes make up these amounts?

a $500 _____5_____   **b** $900 _____9_____

c $4400 _____44_____   **d** $8100 _____81_____

5 Write down the total amount pocket money pictured in each of the questions below. Multiply the amount by 10. Continue doing this to make a pattern. The first one has been done for you.

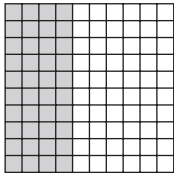|	Pocket money	Total amount	× 10	× 10	× 10
a		$6.55	$65.50	$655	$6550
b		$13.85	$138.50	$1385	$13850
c		$21.50	$215	$2150	$21500

Percentages

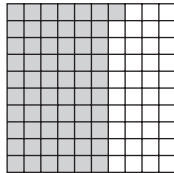The word **cent** comes from the Latin word centum, meaning one hundred. Percent means out of one hundred.

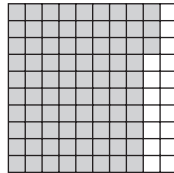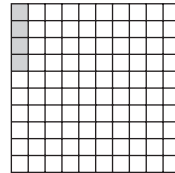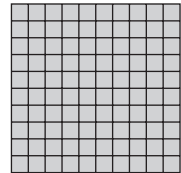**1** Shade the following percentages.

a 40%   **b** 61%   **c** 83%   **d** 4%   **e** 100%

2 Complete the table.
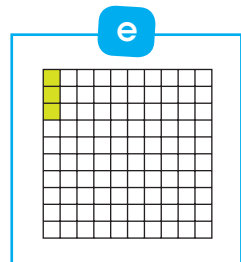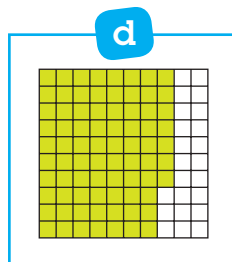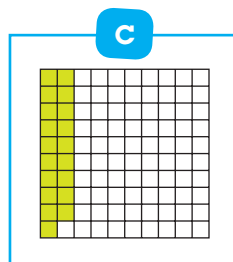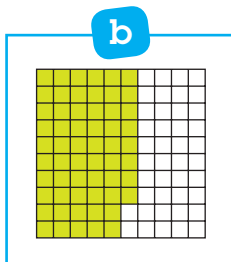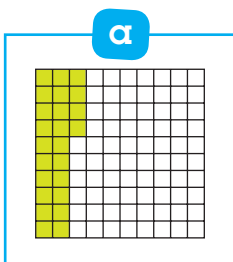
a   b   c   d   e

	a	b	c	d	e
Percentage shaded	24%	58%	19%	77%	3%
Percentage not shaded	76%	42%	81%	23%	97%

3 Complete the table. Shade the 100 square to match.

100 square	Hundredths	Decimal	Percent
	$\frac{42}{100}$	0.42	42%
	$\frac{71}{100}$	0.71	71%
	$\frac{9}{100}$	0.09	9%

What does it mean to give 100%?

Using percentages

1 **a** Convert each mark on the report card into a percentage.

Report Card of Eli Woo		
Subject	**Mark**	**Percentage**
Reading	68/100	*68%*
Writing	88/100	*88%*
Maths	95/100	*95%*

b What percentage did Eli score in Reading? _____ *68%* _____

c How many more marks did Eli need to score 100% in:

i Writing _____ *12* _____   **ii** Maths _____ *5* _____

2 Relative humidity is used to describe the amount of water vapour in the air. It is expressed as a percentage.

a What is the relative humidity in these cities?

i Darwin _____ *90%*   **ii** Sydney _____ *60%*   **iii** Hobart _____ *50%*
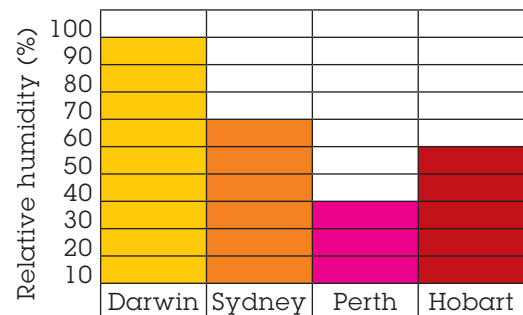
b Which city has the highest relative humidity? _____ *Darwin* _____

3
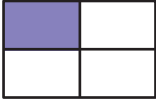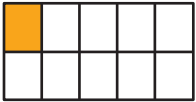
Did you know?			
In 2006, 22% of people living in Australia were born overseas.	Koalas get 90% of the water they need from the leaves they eat.	25% of car accidents are caused by drivers using mobile phones.	In 1990, only 3% of homes in Australia had smoke alarms.

a What percentage of car accidents are not caused by drivers using mobile phones? _____ *75%* _____

b What percentage of homes did not have smoke alarms in 1990? _____ *97%* _____

c In 2006, what percentage of people living in Australia were born in Australia? _____ *78%* _____

d Do koalas get more water from the leaves they eat or the water they drink? _____ *leaves* _____
How do you know this? *Only 10% comes from the water they drink*

Fractions and Decimals **47**

Common fractions and percentages

1 Colour each picture, decimal, fraction and percentage the same colour as the matching picture. The first one has been done for you.

Picture	Decimal	Common fraction	Hundredths	Percentage
	0.10	$\frac{1}{4}$	$\frac{50}{100}$	10%
	0.5	$\frac{1}{10}$	$\frac{10}{100}$	25%
	0.25	$\frac{1}{2}$	$\frac{25}{100}$	50%

2 Order these values from smallest to largest.

a $\frac{1}{2}$, 10%, 0.25 _____ 10%, 0.25, $\frac{1}{2}$ _____

b $\frac{1}{4}$, 50%, 0.10 _____ 0.10, $\frac{1}{4}$, 50% _____

3 Insert >, < or = for each pair.

a 0.10 $\boxed{<}$ $\frac{1}{4}$ **b** $\frac{1}{2}$ $\boxed{=}$ 50%   **c** 0.5 $\boxed{>}$ 10%

4 What percentage of each flag is green?

a 50%   **b** 25%   **c** 100%   **d** 0%
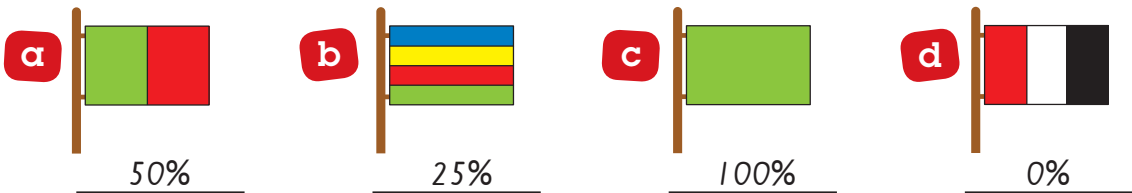
5 Look at these Middle Eastern flags and complete the table.

Turkey   Tunisia   Algeria   Morocco   Kuwait   Sudan
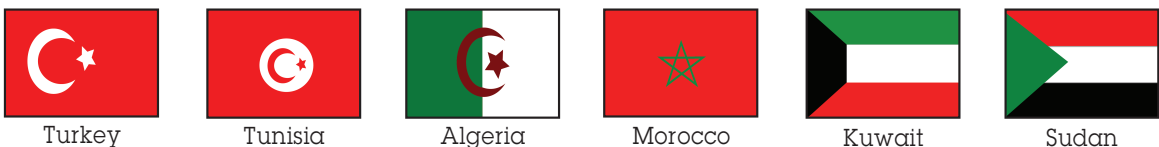
Less than 50% of the country's flag is red	More than 50% of the country's flag is red
Algeria, Kuwait, Sudan	Turkey, Tunisia, Morocco

48 Fractions and Decimals

MiB 2 Card 54

Let's go shopping

1 Reduce the cost of each item by $5.95.

Item	Price	Sale price
	$10.00	$4.05
	$20.00	$14.05
	$25.00	$19.05

2 Fill out the missing values on each shopping docket. Use a calculator to help you.

a
```
      SUPER SHOES

SHOES           $19.95
SOCKS            $6.30


TOTAL           $26.25

CASH            $30.00

CHANGE           $3.75
                ------
```

b
```
        BURGER TIME

BURGER           $5.95
CHIPS            $3.95
DRINK            $2.50


TOTAL           $12.40

CASH            $15.00
                ------

CHANGE           $2.60
```

c
```
JJ'S FASHION

NECKLACE        $12.50
BELT            $19.95
UNDERWEAR       $11.50
LIP GLOSS       $ 7.95


TOTAL           $51.90

CASH            $70.00

CHANGE          $18.10
                ------
```

d
```
BOOK GALORE

HARRY POTTER    $29.95
SHARKS          $14.95
ATLAS           $22.50


TOTAL           $67.40
                ------
CASH           $100.00

CHANGE          $32.60
                ------
```

e
```
HEALTH FOOD

NUTS             $6.50
FRUIT BAR        $1.80
FRUIT JUICE      $3.60
YOGHURT          $4.50


TOTAL           $16.40

CASH            $50.00

CHANGE          $33.60
                ------
```

f
```
    ALL IN THE HOME

BOWL            $15.90
VASE            $20.00
CLOCK           $24.95
CUSHIONS         $8.90
KNIFE           $11.50


TOTAL           $81.25
                ------

CASH            $90.00
CHANGE          $ 8.75
```

Travelling overseas

1 Mike is leaving Australia to travel overseas. What currency will he need to use when he is in the following countries? Use the word bank to help you.

Word bank

rupee(₹)	yen (¥)	rupiah (Rp)
baht (฿)	euro (€)	dollars (HK$)

a Japan _____yen_____ **b** Thailand _____baht_____

c India _____rupee_____ **d** Indonesia _____rupiah_____

e Ireland _____euro_____ **f** Hong Kong _____dollars(HK$)_____

2 Mike's first stop is Thailand. He eats at a local restaurant. How much does he pay in total? Write the answer on the receipt.

```
FISH CAKES        ฿30
SPRING ROLLS      ฿45
PRAWN CURRY       ฿85
COCONUT JUICE     ฿28
                _____
                188 baht
```

3 Mike's second stop is Japan. He buys some souvenirs for his family, pictured. How much does he pay altogether?

_____¥3950_____

fan ¥900	doll ¥1250	mask ¥1800

4 Mike's third stop is Hong Kong. In Hong Kong, A$1 = HK$8. How much does Mike pay in Australian dollars (A$) for the following items? The first one has been done for you.

a drink   HK$32 _____A$4_____   **b** cake   HK$16 _____A$2_____

c bus ticket HK$24 _____A$3_____   **d** t-shirt HK$72 _____A$9_____

e museum   HK$40 _____A$5_____   **f** taxi   HK$120 _____A$15_____

50 Financial Maths

Design a menu

1 Design a menu with prices for a take-away food shop. Include a name for the menu. You could include items such as pizzas, hamburgers, fish, chips, salad, drinks and desserts.

Answers will vary

2 You have $30 to spend on take-away food.

a What could you buy for dinner with this amount? _____

Answers will vary

b How much change would you receive? *Answers will vary*

c What other combinations of food could you buy for $30?

Answers will vary

_____

d How much change would you receive? *Answers will vary*

What would your friend buy from your menu?
How much change would they get from $50?

What is the total cost of all items on your menu?

MiB 2
Cards
27 & 28

Financial Maths **51**

1 Using a mental strategy, calculate the answer to each addition question.

a 58 + 16 = __74__   **b** 26 + 45 = __71__   **c** 113 + 27 = __140__

d 8 + 12 + 51 = __71__   **e** 22 + 88 = __110__   **f** 80 + 59 = __139__

Explain how you worked out Question 1c. _Answers will vary_

_____

2 Using a mental strategy, calculate the answer to each subtraction question.

a 59 − 19 = __40__   **b** 67 − 17 = __50__   **c** 90 − 21 = __69__

d 100 − 31 = __69__   **e** 202 − 95 = __107__   **f** 92 − 39 = __53__

Explain how you worked out Question 2f. _Answers will vary_

_____

3 Every year you have a birthday party and buy your cake from Cakeland. Cakeland has a very strange way of working out the cost if you want to ice your name on the top of your cake. Each letter has a dollar value as shown in the table.

Cakeland – Pay by the letter

A	B	C	D	E	F	G	H	I	J	K	L	M
$1	$2	$3	$4	$5	$6	$7	$8	$9	$10	$11	$12	$13
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
$14	$15	$16	$17	$18	$19	$20	$21	$22	$23	$24	$25	$26

a How much does it cost to ice your name on your cake? _____

How did you work it out? _Answers will vary_

b Which students in your class would pay the following amounts to ice their name on top of their cake?

Under $50	Between $50 and $100	Over $100
	Answers will vary	

When you add and subtract money, remember to keep the decimal points under one another.

1 Using a mental strategy, calculate the answer to each question.

a $20 + 20 + 20 =$ ___60___ **b** $30 + 70 =$ ___100___

c $141 + 21 =$ ___162___ **d** $51 - 10 =$ ___41___

e $95 - 20 =$ ___75___ **f** $104 - 50 =$ ___54___

Explain how you worked out Question 1f. _Answers will vary_

_____

2 **a** Calculate the total cost of each of these rows of sushi.

3.65	4.20	4.10
5.20	5.30	3.90
6.15	4.80	3.85
$15.00	$14.30	$11.85

$3.65 $5.20 $6.15

$4.20 $5.30 $4.80

$4.10 $3.90 $3.85

b How much change would you get from $20 for each combination? ___$5.00___ ___$5.70___ ___$8.15___

3 This group of friends has just arrived at the shopping centre. Arrange the friends into the two elevators below so that they are carrying equal weight.

Tom	Shafi	Luke	Many	Fred	Lulu
34 kg	38 kg	45 kg	36 kg	54 kg	41 kg

Elevator 1	Elevator 2
Tom	Shafi
Many	Luke
Fred	Lulu
Total = 124 kg	Total = 124 kg

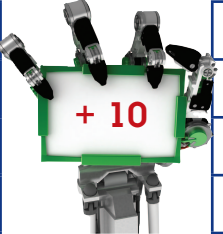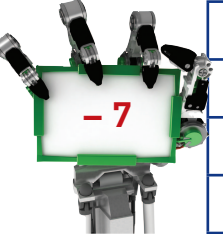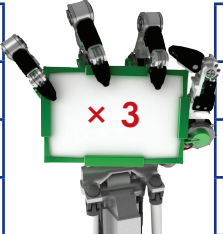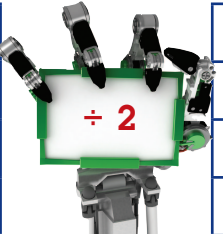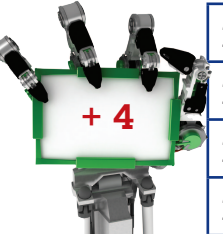MiB 2 Card 24

Describing number patterns
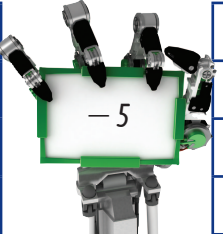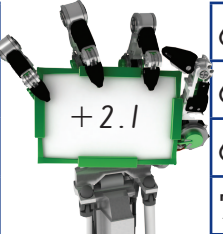
1 Continue these counting patterns. Write the rule for each.

a 3, 13, 23, 33, 43, | 53 | 63 | 73 | *Add 10*

b 99, 88, 77, 66, 55, | 44 | 33 | 22 | *Subtract 11*

c 2.2, 2.4, 2.6, 2.8, 3.0, | 3.2 | 3.4 | 3.6 | *Add 0.2*

d $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$, $\frac{4}{4}$, $\frac{5}{4}$, | $\frac{6}{4}$ | $\frac{7}{4}$ | $\frac{8}{4}$ | *Add $\frac{1}{4}$*

e $9\frac{1}{2}$, 9, $8\frac{1}{2}$, 8, $7\frac{1}{2}$, | 7 | $6\frac{1}{2}$ | 6 | *Subtract $\frac{1}{2}$*

2 When a number passes through the robot it is changed according to the rule programmed into the robot. Complete the number patterns after each number has passed through the robot. The first one has been done for you.

a 7, 8, 9, 10 → **+ 5** → 12, 13, 14, 15

b 45, 46, 47, 48 → **+ 10** → 55, 56, 57, 58

c 20, 22, 24, 26 → **− 7** → 13, 15, 17, 19

d 2, 4, 6, 8 → **× 3** → 6, 12, 18, 24

e 20, 30, 40, 50 → **÷ 2** → 10, 15, 20, 25

f 21, 22, 23, 24 → **+ 4** → 25, 26, 27, 28

3 What is the rule for each? Write it on the robot's hand.

a 54, 64, 74, 84 → **− 5** → 49, 59, 69, 79

b 4.6, 4.7, 4.8, 4.9 → **+ 2.1** → 6.7, 6.8, 6.9, 7.0

4 Colour the number in each number pattern that is not correct.

a

5	10	15	20	21	30

b

1.1	1.3	1.5	1.6	1.9	2.1

c

868	757	646	535	434	545

1 Look at the table of addition facts.

+	1	2	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9	10
2	3	4	5	6	7	8	9	10	11
3	4	5	6	7	8	9	10	11	12
4	5	6	7	8	9	10	11	12	13
5	6	7	8	9	10	11	12	13	14
6	7	8	9	10	11	12	13	14	15
7	8	9	10	11	12	13	14	15	16
8	9	10	11	12	13	14	15	16	17
9	10	11	12	13	14	15	16	17	18

a Add all the numbers to find the total in the:

  i 1st row = _____54_____   **ii** 2nd row = _____63_____

  iii 3rd row = _____72_____   **iv** 4th row = _____81_____

b Write down the pattern you notice. _____increases by 9 each time_____

c Predict the total of adding the numbers in the:

  i 5th row = _____90_____   **ii** 6th row = _____99_____

  iii 7th row = _____108_____   **iv** 8th row = _____117_____

2 **a** Start at 1.
Move diagonally from left to right.

Describe the pattern you find. _____+8_____

_____

SEPTEMBER						
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

b Start at 27.
Move diagonally from left to right.

Describe the pattern you find. _____−6_____

c Draw a square around any 4 dates on the calendar.
Add the diagonally opposite numbers. What do you notice?

_____Answers will vary_____

1 Complete each set of addition number sentences.

a   2 + 3 = ___5___

    3 + 2 = ___5___

b 9 + 4 + 10 = ___23___

    4 + 10 + 9 = ___23___

    10 + 9 + 4 = ___23___

Write the rule about adding numbers.

___*Order doesn't matter*___

_____

2 Complete each set of multiplication number sentences.

a   2 × 5 = ___10___

    5 × 2 = ___10___

b 2 × 3 × 6 = ___36___

    3 × 6 × 2 = ___36___

    6 × 2 × 3 = ___36___

Write the rule about multiplying numbers.

___*Order doesn't matter*___

_____

3 Omar wants to add the numbers on these shirts. Circle the numbers you think Omar should add first. Why did you choose these numbers?

15   18   12

___*Adds to 30*___

4 Tanya wants to multiply the numbers on these shirts. Circle the numbers you think Tanya should multiply first. Why did you choose these numbers?

2   6   5

___*a product is 10*___

5 Add these numbers in your head.

a 3 + 7 + 8 = ___18___   **b** 14 + 17 + 6 = ___37___

c 38 + 25 + 15 = ___78___   **d** 34 + 26 + 50 = ___110___

6 Multiply these numbers in your head.

a 2 × 5 × 3 = ___30___   **b** 5 × 3 × 4 = ___60___

c 4 × 6 × 5 = ___120___   **d** 5 × 7 × 10 = ___350___

Completing number sentences

1 Fill in the missing number.

a $7 \times \boxed{4} = 28$　　**b** $\boxed{7} + 6 = 13$　　**c** $\boxed{18} - 7 = 11$

d $\boxed{18} \div 3 = 6$　　**e** $25 - \boxed{11} = 14$　　**f** $25 \div \boxed{5} = 5$

g $\boxed{10} \times 8 = 80$　　**h** $\boxed{28} - 18 = 10$　　**i** $24 + \boxed{14} = 38$

12

2 Sue's brother spilt blue paint all over the number sentences that she wrote. Circle the number sentences where paint has been spilt over the number 12.

a $\left(18 - = 6\right)$　　**b** $24 \div = 3$　　**c** $\left(\times 3 = 36\right)$

d $\left(- 5 = 7\right)$　　**e** $\left(\div 4 = 3\right)$　　**f** $37 - = 15$

3 Sue's sister spilt purple paint over the number sentence that she wrote in her book.

$ = 20$

What might the number sentence have been?
Fill in the missing boxes and make up 4 more of your own.

a $\boxed{3} + \boxed{17} = 20$　　**b** $\boxed{42} - \boxed{22} = 20$

c $\boxed{5} \times \boxed{4} = 20$　　**d** $\boxed{40} \div \boxed{2} = 20$

Answers will vary

e $\boxed{2} \boxed{\times} \boxed{10} = 20$　　**f** $\boxed{12} \boxed{+} \boxed{8} = 20$

g $\boxed{44} \boxed{-} \boxed{24} = 20$　　**h** $\boxed{100} \boxed{\div} \boxed{5} = 20$

Replace each letter with a number to make each addition correct.

a
```
    A
    A
 +  A
 ────
   BA
```
b
```
   ME
 +  E
 ────
   EM
```
c
```
   CD
    D
 +  D
 ────
   CC
```

Discuss your answers with a partner. Do they have the same or different answers to you?

1 Fill in the missing number.

a $2 \times \boxed{16} = 32$ b $\boxed{26} + 16 = 42$ c $\boxed{32} - 13 = 19$

d $\boxed{33} \div 3 = 11$ e $39 - \boxed{19} = 20$ f $81 \div \boxed{9} = 9$

g $\boxed{4} \times 14 = 56$ h $45 - \boxed{8} = 37$ i $56 + \boxed{35} = 91$

2 Work out the missing number and replace it with the corresponding letter from the table below. The letters will spell out the name of a popular celebration.

a $3 \times 8 = \boxed{24}$ b $\boxed{3} + 32 = 35$ c $\boxed{7} - 0 = 7$

d $\boxed{12} \div 2 = 6$ e $40 - \boxed{15} = 25$ f $30 \div \boxed{10} = 3$

g $\boxed{2} \times 17 = 34$ h $\boxed{20} - 11 = 9$ i $67 + \boxed{5} = 72$

2	3	5	7	10	12	15	20	24
M	H	S	R	T	I	S	A	C

What is the celebration? _____ *Christmas* _____

3 Work out what each shape is worth. Write the number inside the shape.

a ⬤5 + ▢13 = 18   and   ▢13 − ⬤5 = 8

b ◇10 + ★20 = 30   and   ★20 − ◇10 = 10

c ▭19 + ⬭21 = 40   and   ⬭21 − ▭19 = 2

4 Each letter represents a number which is less than 10. Work out the value of each letter and use the answer to work out the next number sentence.

A	B	C	D
5	4	3	7

$A + A + A = 15$ $A \times B = 20$

$B \times C = 12$ $A \times C + D = 22$

$D \times A + B = $ ☺   What is the value of ☺ ? _____ 39 _____

Equivalent number sentences

1 Fill in the missing numbers to make the scales balance. You could write the answer above the scales to make it easier.

a $20 + 20$ $5 \times \underline{\ }$ (8)

b 7×7 $55 - \underline{\ }$ (6)

c $19 + 16$ $\underline{\ } \times 5$ (7)

d $36 - \underline{\ }$ $80 \div 8$ (26)

e $\underline{\ } + 15$ $80 \div 4$ (5)

f $48 - 39$ $\underline{\ } \div 3$ (27)

2 Edie wrote some equivalent number sentences, but not all of them are correct. Use a pencil to tick (✓) those which are correct and cross (✗) those which are incorrect.
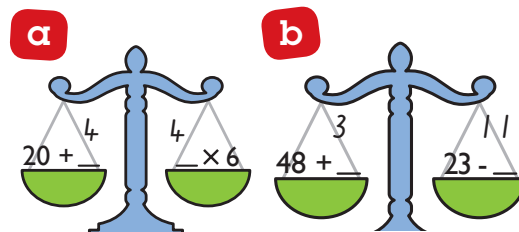
Edie's number sentences

a $13 \times 3 = 24 + 15$ _____✓_____   **b** $66 + 34 = 25 \times 4$ _____✓_____

c $40 \div 5 = 65 - 47$ _____✗_____   **d** $92 - 48 = \frac{1}{2}$ of 88 _____✓_____

e $91 - 11 = 45 + 45$ _____✗_____   **f** $2 \times 60 = 133 - 13$ _____✓_____

g Double $17 = 70 - 46$ _____✗_____   **h** $\frac{1}{4}$ of $60 = 65 - 50$ _____✓_____

3 Match equivalent number sentences by drawing a line between matching pairs.

8 + 8 + 8	45 + 45 – 2
127 – 37	$\frac{1}{2}$ of 48
199 + 51	168 – 132
102 – 14	3 × 30
100 ÷ 5	$\frac{1}{4}$ of 80
Triple 12	Double 125

4 Fill in two numbers to make the scales balance.

a $20 + \underline{\ }$ $\underline{\ } \times 6$ (4) (4)

b $48 + \underline{\ }$ $23 - \underline{\ }$ (3) (11)

Could different numbers be used to make them balance?

Just for fun Two numbers multiply to give 54 and add to give 21. What are the two numbers?

Patterns and Algebra   **59**