

WA5MNAMN1

Modelling with number

Core + Challenge

NAPLAN-style

Problem Solving with Number — Marking Key

I can show a real problem with a diagram and an equation, solve it, and explain what the answer means.

For tutors and parents. Award method marks for correct working even if the final answer is wrong.

Marks summary

A Warm up: 16 B Practise: 21 C Think it through: 10 D Challenge: 9 **Total: 56**

Gold shading in this key shows what the child should have shaded or drawn. Accept any correct arrangement unless the question fixes it.

A

Warm up *answers*

/ 16 marks

Q	Answer	Model answer / notes	Marks
1	$250 + 175 = 425$	The parts add to the whole.	1
2	$600 - 240 = 360$	Whole – part = other part. Accept $240 + ? = 600$.	1
3	$4 \times 35 = 140$	4 equal parts of 35. Accept $35 + 35 + 35 + 35 = 140$.	1
4	$96 \div 8 = 12$	96 shared into 8 equal parts. Accept $8 \times ? = 96$.	1
5	$64 - 18 = 46$	64 + 18 64 - 18 18 - 64 $64 - 18 = 46$.	1
6	$5 \times 12 = 60$	$5 \times 12 = 60$.	1
7	$48 \div 4 = 12$	$48 \div 4 = 12$.	1
8	$9 + 27 = 36$	27 - 9 9 + 27 27 ÷ 9 $9 + 27 = 36$.	1
9	63	Sam 45 Jo 45 18 Sam: 45. Jo: 45 and 18 more. $45 + 18 = 63$.	1
10	30 cm	150 30 30 30 30 30 $150 \div 5 = 30$ cm.	1

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Q	Answer	Model answer / notes	Marks
11	45	80  $80 - 35 = 45.$	1
12	150	$6 \times 25 = 150.$	1
13	175	$300 - 125 = 175.$	1
14	124	$76 + 48 = 124.$	1
15	14	$84 \div 6 = 14.$	1
16	85	$17 \times 5 = 85.$	1

B

Practise *answers and working*

/ 21 marks

Q	Answer	Working / sample response	Marks
1	$386 - 127 + 58 = 317$	$386 - 127 = 259.$ $259 + 58 = 317$ people. <i>1 mark: a correct equation (or two correct steps).</i> <i>1 mark: 317.</i>	2
2	Mia 1,730 m; total 2,980 m	Tom 1,250 Mia 1,250 480 $\left. \begin{array}{l} \text{Tom} \\ \text{Mia} \end{array} \right\} 2,980$ Mia: $1,250 + 480 = 1,730$ m. Altogether: $1,250 + 1,730 = 2,980$ m. <i>1 mark: bar model labelled.</i> <i>1 mark: 1,730 m.</i> <i>1 mark: 2,980 m.</i>	3
3	\$126	Child \$14 Adult \$14 \$14 \$14 Adult: $3 \times \\$14 = \\$42.$ 2 adults: $2 \times \\$42 = \\$84.$ 3 children: $3 \times \\$14 = \\$42.$ $\\$84 + \\$42 = \\$126.$ <i>1 mark: \$42 for an adult.</i> <i>1 mark: \$84 and \$42.</i> <i>1 mark: \$126.</i>	3

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Q	Answer	Working / sample response	Marks																
4	Cy (145 pages)	<table border="1"> <thead> <tr> <th>Name</th><th>Days</th><th>Pages</th><th>Total</th></tr> </thead> <tbody> <tr> <td>Ava</td><td>6</td><td>24</td><td>144</td></tr> <tr> <td>Ben</td><td>8</td><td>17</td><td>136</td></tr> <tr> <td>Cy</td><td>5</td><td>29</td><td>145</td></tr> </tbody> </table> Ava: $6 \times 24 = 144$ pages. Ben: $8 \times 17 = 136$ pages. Cy: $5 \times 29 = 145$ pages. Cy read the most (145), just 1 page more than Ava. 2 marks: all three totals (1 mark for two). 1 mark: Cy.	Name	Days	Pages	Total	Ava	6	24	144	Ben	8	17	136	Cy	5	29	145	3
Name	Days	Pages	Total																
Ava	6	24	144																
Ben	8	17	136																
Cy	5	29	145																
5	$12 \times 6 + 540 = 612$	$540 + 12 + 6$ $12 \times 6 + 540$ $540 \times 12 + 6$ $540 - 12 \times 6$ The new chairs are 12 packs of 6: $12 \times 6 = 72$. $72 + 540 = 612$ chairs. 1 mark: circles $12 \times 6 + 540$. 1 mark: 612.	2																
6	\$369; 4 muffins left	$250 \div 6 = 41 \text{ r } 4$, so 41 full boxes and 4 muffins left over. $41 \times \\$9 = \\$369$. 1 mark: 41 boxes and 4 left. 1 mark: \$369.	2																
7	$? - 14 = 29$; 43	$? - 14 = 29$. Work backwards: $29 + 14 = 43$ children. 1 mark: $? - 14 = 29$ (or $29 + 14 = ?$). 1 mark: 43.	2																
8	342 km	Perth to Bunbury: $72 + 99 = 171$ km. There and back: $2 \times 171 = 342$ km. 1 mark: 171 km (one way). 1 mark: 342 km.	2																
9	121 people	Estimate: $4 \times 30 = 120$, plus about 10 teachers is about 130. 1,121 is far too big. Exact: $4 \times 28 = 112$, $112 + 9 = 121$ people. 1 mark: estimate used to show 1,121 is not reasonable. 1 mark: 121.	2																

C Think it through *sample answers and criteria*

/ 10 marks

Q	Answer	Working / sample response	Marks
1	No, Sam has 33	Tom has more, so Tom's bar is longer than Sam's by 12. $\text{Sam} = 45 - 12 = 33$ stickers. <i>1 mark: No, 33.</i> <i>1 mark: explanation or bar model showing Tom's bar is 12 longer.</i>	2
2	True	Both ask for the difference between 36 and 90. Subtraction undoes addition: $90 - 36 = 54$ and $36 + 54 = 90$. <i>1 mark: True.</i> <i>1 mark: explains addition and subtraction are inverses (both 54).</i>	2
3	Sometimes	☐ Always ☒ Sometimes ☐ Never "Sam has 5 apples and Jo has 7. How many altogether?" is $5 + 7 = 12$. "5 bags of 6 apples. How many altogether?" is $5 \times 6 = 30$ (multiplication). So only sometimes. <i>1 mark: Sometimes.</i> <i>1 mark: an example that is not addition.</i>	2
4	+ 25 = 30	$45 \div 3 = 15$, $15 \times 4 = 60$ and $100 - 15 = 85$, so three boxes hold 15. In the last one the box is 5. <i>1 mark: the last one.</i> <i>1 mark: shows the other three are 15.</i>	2
5	Ava; 124 students	The 38 students are away, so they must be taken away from the total. $6 \times 27 = 162$. $162 - 38 = 124$ students. <i>1 mark: Ava, with a reason.</i> <i>1 mark: 124.</i>	2

D Challenge *solutions and criteria*

/ 9 marks

Q	Answer	Working / sample response	Marks
1	Adult \$28, child \$18	If each child ticket cost \$10 more, the total would be $\\$110 + 3 \times \\$10 = \\$140$ for 5 adult tickets. $\\$140 \div 5 = \\$28$ for an adult. Child: $\\$28 - \\$10 = \\$18$. Check: $2 \times 28 + 3 \times 18 = 56 + 54 = 110$. <i>1 mark: a useful diagram or step (e.g. \$140).</i> <i>1 mark: \$28.</i> <i>1 mark: \$18 with a check. Accept guess-and-check that is shown.</i>	3

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Q	Answer	Working / sample response	Marks												
		<table><tr><th>of 4</th><th>of 6</th><th>People</th></tr><tr><td>0</td><td>5</td><td>30</td></tr><tr><td>3</td><td>3</td><td>30</td></tr><tr><td>6</td><td>1</td><td>30</td></tr></table>	of 4	of 6	People	0	5	30	3	3	30	6	1	30	
of 4	of 6	People													
0	5	30													
3	3	30													
6	1	30													
2	0 and 5, 3 and 3, 6 and 1	Try the number of 6-seat tables: $5 \times 6 = 30$ (no 4-seat tables). $3 \times 6 = 18$, 12 left = 3 tables of 4. $1 \times 6 = 6$, 24 left = 6 tables of 4. 2 or 4 tables of 6 leave 18 or 6, which do not split into 4s. So there are 3 ways. <i>1 mark: two correct ways.</i> <i>1 mark: all three ways (or the two ways that use both kinds of table, if the child explains that both kinds must be used).</i> <i>1 mark: shows a system.</i>	3												
3	1,610 L	Water used: $14 \times 185 = 2,590$ L. Rain added: $2 \times 600 = 1,200$ L. $3,000 - 2,590 + 1,200 = 1,610$ L. <i>1 mark: 2,590 L.</i> <i>1 mark: 1,200 L.</i> <i>1 mark: 1,610 L.</i>	3												