

Reasoning and Problem Solving

Step 5: Two-Way Tables

National Curriculum Objectives:

Mathematics Year 5: (5S1) [Complete, read and interpret information in tables, including timetables](#)

Differentiation:

Questions 1, 4 and 7 (Problem Solving)

Developing Write a possible question about the missing information in a two-way table. Includes up to three sets of data with whole numbers up to 1,000 and direct data retrieval.

Expected Write possible questions about the missing information in a two-way table. Includes up to four sets of data with whole numbers up to 1,000 and some multistep interpretation.

Greater Depth Write possible questions about the missing information in a two-way table. Includes up to four sets of data with decimals, multistep interpretation, inference and prediction.

Questions 2, 5 and 8 (Reasoning)

Developing Decide whether the answer given to a missing value in a two-way table is correct. Includes up to three sets of data with whole numbers up to 1,000 and direct data retrieval.

Expected Decide whether the method given to find a missing value in a two-way table is correct. Includes up to four sets of data with whole numbers up to 1,000 and some multistep interpretation.

Greater Depth Decide whether the method given to find a missing value in a two-way table is correct. Includes up to four sets of data with decimals, multistep interpretation including inference and prediction.

Questions 3, 6 and 9 (Problem Solving)

Developing Complete missing parts of a two-way table using 3 clues. Includes up to three sets of data with whole numbers up to 1,000 and direct data retrieval.

Expected Complete missing parts of a two-way table using 3 clues. Includes up to four sets of data with whole numbers up to 1,000 and some multistep interpretation.

Greater Depth Complete missing parts of a two-way table using 3 clues. Includes up to four sets of data with decimals, multistep interpretation including inference and prediction.

More [Year 5 Statistics](#) Resources.

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Two-Way Tables

1a. This table shows the gender and birth year of children at a school.

	2011	2012	Total
Boys	25	A	44
Girls	13	18	31
Total	B	37	75

Write two word problems where the answer would be A or B. Select the correct answer for each.

38 24 19



PS

Two-Way Tables

1b. This table shows the hobbies of students at a school.

	Plays sport	Does not play sport	Total
Plays an instrument	18	38	56
Does not play an instrument	A	9	35
Total	44	B	91

Write two word problems where the answer would be A or B. Select the correct answer for each.

47 32 26



PS

2a. This table shows the number of boxes packed in a day at a factory.

	AM	PM	Total
Kylie	24		42
Billy	21	22	43
Total	45	40	85

Kylie says, "I think I packed more boxes in the afternoon."

Do you agree with Kylie? Convince me.



R

2b. This table shows the flavours of smoothie sold at a fayre.

	Small	Med	Total
Blue Raspberry	14	32	46
Lemon and Lime		25	42
Total	31	57	88

James says, "I think more small lemon and lime smoothies were sold than small blue raspberry."

Do you agree with James? Convince me.



R

3a. Using the information below, complete the two-way table.

KS2 Breakfasts

	Yes	No	Total
Y5		12	47
Y6	36	17	
Total	71		100

- There is one more Year 6 child that eats breakfast than in Year 5.
- 29 children don't eat breakfast.
- True or false? There are more children in Year 5. Explain how you know.



R

3b. Using the information below, complete the two-way table.

Seasons Preferred

	Y1	Y2	Total
Winter			53
Summer	23	22	45
Total	57		98

- In Year 2, 3 more children prefer winter than summer.
- In Year 1, 34 children prefer winter.
- True or false? There are more children in Year 2. Explain how you know.



R

Two-Way Tables

4a. This table shows which hand children write with.

	Reception	Y1	Y2	Total
Left	A	12	15	41
Right	34	48	43	B
Total	48	60	58	166

Write two word problems where the answer would be A or B. Calculate the correct answer for each.



PS

Two-Way Tables

4b. This table shows where students are going after they have left school.

	Male	Female	Total
University	236	325	561
Apprenticeship	124	75	199
Work	A	126	219
Total	453	526	B

Write two word problems where the answer would be A or B. Calculate the correct answer for each.



PS

5a. This table shows the number of sandwiches made by three kitchen staff.

	Cheese	Tuna	Ham	Total
Hillary	62	83		
Zack	67	107	62	236
Yussuf	83		42	137
Total		202	150	564

Yussef says, "I think I made 12 tuna sandwiches."

Do you agree with Yussef? Convince me.



R

5b. This table shows the flavours of crisps sold at a tuck shop.

	Mon	Tue	Wed	Thur	Total
Salted		46	51	11	165
Cheese	43	35	32	23	132
Paprika	33	32		53	
Total	133	113	130	87	463

Molly says, "I think 45 bags of paprika crisps were sold on Wednesday."

Do you agree with Molly? Convince me.



R

6a. Using the information below, complete the two-way table.

Age and Pizza Topping Preference

	< 21	21-30	> 30	Total
Cheese	73	164	105	
Pepperoni	53		45	
Hawaiian			30	
Total	160	361		

- 701 people were surveyed in total.
- Twice as many people like cheese than pepperoni.
- True or false? Over 30s eat more pizza. Explain how you know.



R

6b. Using the information below, complete the two-way table.

Animal Preference

	Y1	Y2	Y3	Total
Dog		63	84	
Cat	67	167	13	247
Hamster	23			224
Total				

- There are 271 children in Year 3.
- 106 more Year 1 children like dogs than cats.
- True or false? There are 25 fewer children in Y2 compared to Y3. Explain how you know.



R

Two-Way Tables

7a. This table shows the average size and colour of jumpers made at a factory each day.

	XS	S	M	L	Total
Black	85.6	115.7	104.7	101.3	407.3
White	34.3	43.7	A	43.6	B
Blue	52.7	69.6	84.9	57.6	264.8
Total	172.6	229	252.6	202.5	856.7

Write two word problems that use A or B. Calculate the correct answer for each.



PS

Two-Way Tables

7b. This table shows the average vocabulary size of students in each language.

	Y10	Y11	Total
French	164.2	174.3	338.5
Spanish	172.4	A	288.7
German	84.5	95.4	B
Urdu	17.3	7.2	24.5
Total	438.4	393.2	831.6

Write two word problems that use A or B. Calculate the correct answer for each.



PS

8a. This table shows the average number of phone calls made each week.

	Mon	Tue	Wed	Thu	Total
Sales	32.4	26.2	36.2		100.2
Delivery			30.3		131.2
Support	31.2		35.1	31.6	
Total	74.2	86.3	101.6	99.8	361.9

Frank in delivery says, "I think we averaged 62.8 phone calls on Thursday."

Do you agree with Frank? Convince me.



PS

8b. The table shows the average number of fruit sold in a week.

	Mon	Tues	Wed	Thur	Total
Apples	46.2	26.2	35.2	26.5	134.1
Pears	16.3				
Oranges	31.5	36.2	27.2	36.1	131
Total		104	84	84.2	366.2

Greg says, "I think 7.1 fewer pieces of fruit are sold on Mondays compared to the total number of pears sold the week."

Do you agree with Greg? Convince me.



PS

9a. Using the information below, complete the two-way table.

Average House Points in each Year Group

	Y8	Y9	Y10	Y11	Total
Elves		52.6	41.5	48.3	
Dwarves	41.3		57.1	39.3	
Dragons	18.9		17.4		
Total	107.4			105.9	429.6

- In Year 9, Dwarves averaged 31.5 points.
- In Year 8 and Year 9, Elves totalled an average of 99.8 points.
- True or false? A year 9 pupil gets a house point. They're least likely to be in Dragons house. Explain how you know.



R

9b. Using the information below, complete the two-way table.

Average Number of People and Sports Preference Across Two Companies

	< 21	21 - 30	30 +	Total
Football	204.1		105.1	444.5
Cricket	15.3			
Rugby			46.1	133.8
Other	72.4	72.1	68.2	212.7
Total	344.4	295.6	282.0	922

- 62.6 over 30s like cricket.
- 11 more over 30s like rugby than 21-30s.
- True or false? A 45 year old joins one of the companies. They're mostly likely to prefer cricket. Explain how you know.



R

Reasoning and Problem Solving Two-Way Tables

Developing

1a. Various answers, for example: A = How many boys were born in 2012? 19; B = How many children were born in 2011? 38

2a. Kylie is incorrect. She packed 18 boxes in the afternoon. $42 - 24 = 18$.

3a.

	Yes	No	Total
Y5	35	12	47
Y6	36	17	53
Total	71	29	100

False. I know because there are 53 children in Y6 and 47 in Y5. 53 is a larger number than 47.

Expected

4a. Various answers, for example: A = How many children in reception are left-handed? 14; B = How many right-handed children are in the infant school? 125

5a. Yussef is correct. He made 12 tuna sandwiches. $83 + 107 = 190$. $202 - 190 = 12$.

6a.

	<21	21-30	>30	Total
Cheese	73	164	105	342
Pepperoni	53	73	45	171
Hawaiian	34	124	30	188
Total	160	361	180	701

False. 180 people over 30 eat pizza whereas 361 people between 21-30 eat pizza.

Greater Depth

7a. Various answers, for example: A = How many more medium white jumpers were made than small white jumpers? $(63 - 43.7) 19.3$; B = How many white jumpers were made altogether? 184.6

8a. Frank is correct. Delivery averaged 62.8 calls on Thursday.

9a.

	Y8	Y9	Y10	Y11	Total
Elves	47.2	52.6	41.5	48.3	189.6
Dwarves	41.3	31.5	57.1	39.3	169.2
Dragons	18.9	16.2	17.4	18.3	70.8
Total	107.4	100.3	116	105.9	429.6

True. This is because Dragons averaged the fewest points.

Reasoning and Problem Solving Two-Way Tables

Developing

1b. Various answers, for example: A = How many students played sport but did not play an instrument? 26; B = How many students did not play sport? 47

2b. James is correct. 17 lemon and lime smoothies were sold. $31 - 14 = 17$.

3b.

	Y1	Y2	Total
Summer	34	19	53
Winter	23	22	45
Total	57	41	98

False. There are only 41 children in Y2 which is much less than the 57 in Y1.

Expected

4b. Various answers, for example: A = How many females plan to go into work? 93; B = How many students were leaving the school altogether? 979

5b. Molly is incorrect. 47 bags of paprika crisps were sold. $33 + 32 + 53 = 118$. $165 - 118 = 47$.

6b.

	Y1	Y2	Y3	Total
Dog	173	63	84	320
Cat	67	167	13	247
Hamster	23	27	174	224
Total	263	257	271	791

False. $271 - 257 = 14$ so there 14 fewer children in Y2.

Greater Depth

7b. Various answers, for example: A = How many fewer Year 11 students studied Spanish than those in Year 10? $(172.4 - 116.3) 56.1$; B = How many students studied German? 179.9

8b. Greg is correct. 7.1 fewer pieces of fruit were sold on Monday compared to total numbers of pears sold. $101.1 - 94 = 7.1$.

9b.

	< 21	21 - 30	30 +	Total
Football	204.1	135.3	105.1	444.5
Cricket	15.3	53.1	62.6	131.0
Rugby	52.6	35.1	46.1	133.8
Other	72.4	72.1	68.2	212.7
Total	344.4	295.6	282	922

False. Although more 30+ like cricket, football is still the most preferred.