

Two-Way Table Problem Solving

A survey of 100 students revealed the following information about their preference for coffee and tea:

	Likes Coffee	Does Not Like Coffee	Total
Likes Tea	30	20	50
Does Not Like Tea	25	25	50
Total	55	45	100

How many students like both coffee and tea?

Using the table above, how many students like neither coffee nor tea?

Using the table above, what is the probability that a randomly selected student likes coffee, given that they like tea?

In a group of 200 people, 120 own a car, 80 own a bike, and 50 own both. Construct a two-way table showing this information and find how many people own neither a car nor a bike.

A two-way table summarizes the results of a class test:

	Passed	Failed	Total
Boys	12	8	20
Girls	18	12	30
Total	30	20	50

What is the probability that a student selected at random is a girl who passed?

Using the table above, what percentage of all students failed?

Maths with Melissa

A two-way table is constructed as follows:

	Science	Humanities	Total
Male	40	25	65
Female	30	35	65
Total	70	60	130

How many students are female and study Humanities?

Using the table above, what is the probability that a randomly chosen student is either male or studies Science?

A school has 120 students. 70 take Mathematics, 55 take Physics, and 30 take both. How many students take neither Mathematics nor Physics? Present your answer using a two-way table.

In a survey, 90 people were asked if they like apples and/or oranges. 60 like apples, 50 like oranges, and 20 like both. How many like only apples? How many like only oranges? How many like neither? Show your calculations.

Maths with Melissa

Answer Key

1. 30 students like both coffee and tea.
2. 25 students like neither coffee nor tea.
3. Probability = $30/50 = 0.6$ (or 60%).
4. Two-way table:

	Owns Bike	Does Not Own Bike	Total
Owns Car	50	70	120
Does Not Own Car	30	50	80
Total	80	120	200

Number who own neither = $200 - (120 + 80 - 50) = 50$ people.

5. Probability = $18/50 = 0.36$ (or 36%).
6. Percentage failed = $(20/50) \times 100 = 40\%$
7. 35 students are female and study Humanities.
8. Number who are male or study Science = 40 (male & science) + 25 (male & humanities) + 30 (female & science) = 95 . Probability = $95/130 \approx 0.731$ (or 73.1%).
9. Two-way table:

	Take Physics	Do Not Take Physics	Total
Take Mathematics	30	40	70
Do Not Take Mathematics	25	25	50
Total	55	65	120

Number who take neither = 25.

10. Like only apples: $60 - 20 = 40$

Like only oranges: $50 - 20 = 30$

Like neither: $90 - (40 + 30 + 20) = 0$

Calculations:

- Only apples: 40
- Only oranges: 30
- Both: 20
- Neither: 0