

# Constructing Two-Way Frequency Tables



**Two-way frequency tables** show frequencies for two categorical, or qualitative, variables. Frequency is the number of times a particular event occurs.

For example, the two-way frequency table below shows information about the number of soup orders placed at Silver City Diner yesterday. The variables are soup type and bowl size.

Values in the body of the table are called **joint frequencies**. Each joint frequency tells about a combination of the two variables. For example, there were **21** orders for small bowls of tomato basil soup.

Values in the total row and column, with the exception of the total for the entire table, are called **marginal frequencies**. Each marginal frequency tells the total for a category. For example, there were **40** orders for tomato basil soup.

	Tomato Basil	Chicken Noodle	Total
Small Bowl	21	26	47
Large Bowl	19	22	41
Total	40	48	88

The bottom right corner shows the total for the table. So, there were **88** soup orders in all.

**Try it yourself!** Complete each two-way frequency table below based on the given information.

- 1** Jeremiah surveyed 86 students at his school to see how many play a team sport. Of the 7th graders he surveyed, 18 play a team sport and 12 do not. Of the 8th graders he surveyed, 32 play a team sport and 24 do not.

	Team Sport	No Team Sport	Total
7th Graders	18	12	30
8th Graders	32	24	56
Total	50	36	86

- 2** A total of 146 students bought tacos for lunch at Elm Middle School yesterday. Of the students who bought hard-shell tacos, 44 got chicken filling and 37 got vegetarian filling. Of the students who bought soft-shell tacos, 38 got chicken filling and 27 got vegetarian filling.

	Hard-Shell	Soft-Shell	Total
Chicken	44	38	82
Vegetarian	37	27	64
Total	81	65	146

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**Keep going!** Complete each two-way frequency table below based on the given information. Then, answer the question using the completed table.

- 3** Kai's Kabobs food truck offers lemonade and flavored water. Yesterday, a total of 26 adults and 12 children ordered lemonade. Also, a total of 29 adults and 24 children ordered flavored water.

	Lemonade	Flavored Water	Total
Adults	26	29	55
Children	12	24	36
Total	38	53	91

How many more people ordered flavored water than lemonade? 15

- 4** Last week, 71 people got their ears pierced at Accessories Plus, where a free pair of pearl or stone earrings is included with every piercing. Of those who got gold earrings, 24 got pearls and 19 got stones. Of those who got silver earrings, 16 got pearls.

	Gold	Silver	Total
Pearls	24	16	40
Stones	19	12	31
Total	43	28	71

How many more people got pearl earrings than stone earrings? 9

- 5** On field day, the students at Park Middle School had a picnic lunch. Each student chose a fruit and a side. Of the students who chose chips, 66 chose an apple and 48 chose grapes. Of the 103 students who chose pretzels, 59 chose an apple and the rest chose grapes.

	Apple	Grapes	Total
Chips	66	48	114
Pretzels	59	44	103
Total	125	92	217

How many more students chose apples than grapes? 33

- 6** Bea sends a free sample with every order from her online store, Baths by Bea. Each sample is either lavender scented or citrus scented. Last month, she sent 93 soap samples, 47 of which were citrus scented. She also sent 71 lotion samples, 18 of which were citrus scented.

	Soap	Lotion	Total
Lavender	46	53	99
Citrus	47	18	65
Total	93	71	164

How many more lavender samples did Bea send than citrus samples? 34