

7.3b Two-Way Tables

A **two-way table** displays two categories of data collected from the same source. You can use a two-way table to draw conclusions about how the categories are related.

EXAMPLE 1 Interpreting a Two-Way Table

You randomly survey students in a school about their last test grade and whether they studied for the test. The results of the survey are shown in the two-way table.

		Student	
		Studied	Did Not Study
Grade	Passed	21	2
	Failed	1	6

- a. How many of the students in the survey studied for the test and passed?

The number in the “Studied” column and “Passed” row is 21.

So, 21 of the students in the survey studied for the test and passed.

- b. Find and interpret the sum of the entries in each row and column.

		Student		Total
		Studied	Did Not Study	
Grade	Passed	21	2	23
	Failed	1	6	7
Total		22	8	30

23 students passed.
7 students failed.
22 students studied.
8 students did not study.
30 students were surveyed.

Practice

1. **ATTENDANCE** You randomly survey students in a cafeteria about their plans for a football game and a school dance. The results of the survey are shown in the two-way table.

- a. How many of the students in the survey are attending the dance but not the football game?
- b. Find and interpret the sum of the entries in each row and column.
- c. What percent of the students in the survey are not attending either event?

		Football Game	
		Attend	Not Attend
Dance	Attend	35	5
	Not Attend	16	20

EXAMPLE 2 Finding a Relationship in a Two-Way Table

Rides bus

Age	Tally
12-13	
14-15	
16-17	

You randomly survey students between the ages of 12 and 17 about whether they ride the bus to school in the morning. The results are shown in the tally sheets.

- a. Make a two-way table including the totals of the rows and columns.

		Age			Total
		12-13	14-15	16-17	
Student	Rides Bus	24	12	14	50
	Does Not Ride Bus	16	13	21	50
Total		40	25	35	100

Does not ride bus

Age	Tally
12-13	
14-15	
16-17	

- b. For each age group, what percent of the students in the survey ride the bus to school? do not ride the bus to school? Organize the results in a two-way table. Explain what one of the entries represents.

		Age		
		12-13	14-15	16-17
Student	Rides Bus	60%	48%	40%
	Does Not Ride Bus	40%	52%	60%

$$\frac{14}{35} = 0.4$$

So, 40% of the 16- and 17-year-old students in the survey ride the bus to school.

- c. Does the table in part (b) show a relationship between age and whether students ride the bus to school? Explain.

❖ The table shows that as age increases, students are less likely to ride the bus to school.

Practice

2. **LUNCH** You randomly survey students in a school about whether they buy a school lunch or pack a lunch.

Grade 6 Students: 11 pack lunch, 9 buy school lunch

Grade 7 Students: 23 pack lunch, 27 buy school lunch

Grade 8 Students: 16 pack lunch, 14 buy school lunch

- Make a two-way table including the totals of the rows and columns.
- For each grade level, what percent of the students in the survey pack a lunch? buy a school lunch? Organize the results in a two-way table. Explain what one of the entries represents.
- Does the table in part (b) show a relationship between grade level and lunch choice? Explain.