Lesson 9.3:

Two-Way Tables

Essential Question

How can you read and make a two-way table?

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

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

joint frequency

21 students

Find and interpret the marginal frequencies for the survey.

Joint frequency

Where the categories intersect (join)

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

Marginal frequency

Totals written along the edges (margins)

Interpret the frequencies

Write what they mean

22 studied, 8 did not study,

23 passed, 7 failed,

30 took the test

1. You randomly survey students in a cafeteria about their plans for a football game and a school dance. The two-way table shows your results.

		Football Game: Attend	Football Game: Not Attend	
Dance	Attend	35	5	40
Dance	Not Attend	16	20	36
		51	25	76

a. How many students will attend the dance but not the football game?

5 students

b. Find and interpret the marginal frequencies for the survey.

51 attended the game,
25 did not attend the game,
40 attended the dance,
36 did not attend the dance,
76 students were surveyed

You randomly survey students between the ages of 12 and 17 about whether they ride the bus to school. The results are shown in the tally sheets. Make a two-way table that includes the marginal frequencies.

Rides Bus

Age	Tally	
12-13	𝍸 𝍸 𝍸 𝍸 |||	24
14-15	𝍸 𝍸 ||	12
16-17	𝍸 𝍸 |||	14

Does Not Ride Bus

Age	Tally	
12-13	𝍸 𝍸 |	16
14-15	𝍸 𝍸 |||	13
16-17	𝍸 𝍸 𝍸 |	25

	Rides	Doesn't Ride	
12-13	24	16	40
14-15	12	13	25
16-17	14	25	39
	50	54	104

Use the two-way table in Example 3.

a. 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.

	R	DR
12-13	24/40	16/40
14-15	12/25	13/25
16-17	14/39	25/39

	R	DR
12-13	60%	40%
14-15	48%	52%
16-17	36%	64%

i.e., 48% of 14-15 year olds ride the bus.

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

Yes, a smaller percentage of older students ride the bus - likely b/c they or their friends can drive.

2. You randomly survey students in a school about whether they buy a school lunch or pack a lunch. Your results are shown.

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

a. Make a two-way table that includes the marginal frequencies.

	Pack	Buy	
6th	11	9	20
7th	23	27	50
8th	16	14	30
	50	50	100

b. 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.

	P	b
6	11/20	9/20
7	23/50	27/50
8	16/30	14/30

	P	b
6	55%	45%
7	46%	54%
8	53%	47%

c. Does the table in part (b) show a relationship between grade level and lunch choice? Explain.

No, there is no obvious relationship shown.