

Two-Way Tables and Relative Frequencies

Grade 8 math · Worksheet · Standards: 8.SP.A.4

Name: _____ Date: _____ Class: _____

These problems build two-way frequency tables, compute row and column relative frequencies, and describe association between categorical variables (standard 8.SP.A.4). Early problems read counts; later ones use percents to compare groups of different sizes. Decide which total to divide by before computing any percent.

Standards: 8.SP.A.4 · **Level:** Grade 8

Problem 1 Find the totals (easy)

A survey asked 70 students whether they have a pet and whether they like hiking. Find the row totals, the column totals, and the grand total.

	Likes hiking	Does not like hiking
Has a pet	18	12
No pet	14	26

Problem 2 Read one cell (easy)

Use the table from Problem 1. How many students have a pet and like hiking?

Problem 3 Marginal count (easy)

Use the table from Problem 1. How many students do not like hiking?

Problem 4 From a list to a table (easy)

Ten students answered two questions. Each pair shows (reads for fun, plays an instrument): (Y, Y), (Y, N), (N, N), (Y, Y), (N, Y), (Y, N), (N, N), (Y, Y), (N, N), (Y, N). Make a two-way table with totals.

Problem 5 Share of the whole (easy)

Use the table from Problem 1. What percent of all 70 students have a pet and like hiking? Round to the nearest tenth of a percent.

Problem 6 Row percents (medium)

Use the table from Problem 1. Find the row relative frequencies as percents.

Problem 7 Column percents (medium)

Use the table from Problem 1. Find the column relative frequencies as percents, to the nearest tenth.

Problem 8 Row percents from a table (medium)

The table shows the favorite sport of 100 students. Find the row relative frequencies as percents.

Grade	Soccer	Basketball	Total
7th grade	21	29	50
8th grade	33	17	50
Total	54	46	100

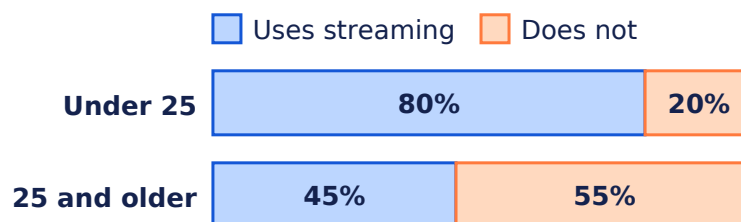
Favorite sport by grade.

Problem 9 Compare the groups (medium)

Use Problem 8. Which grade is more likely to choose soccer? Does the table suggest an association between grade and favorite sport?

Problem 10 Read the bars (medium)

The segmented bars show the percent of each age group that uses a streaming service. Is there an association between age group and streaming use? Explain.



Streaming use by age group.

Problem 11 Missing entries (medium)

A two-way table has these entries: row 1 is 25 and a blank, row 2 is a blank and 20. The row totals are 40 and 50 and the grand total is 90. Find the blanks and the column totals.

Problem 12 A table with no pattern (medium)

The table shows whether 40 students play video games and whether they passed a science quiz. Find the row relative frequencies to the nearest percent and decide whether there is an association.

Video games	Passed quiz	Did not pass	Total
Plays games	17	7	24
Does not play	11	5	16
Total	28	12	40

Video games and a science quiz.

Problem 13 Explain a percent (medium)

In a two-way table of grade level and lunch choice, the row relative frequency for eighth graders who bring a bag lunch is 60%. Explain what the 60% tells you.

Problem 14 Big and small groups (hard)

A table shows that 90 students joined a club. Of them, 54 are seventh graders. There are 300 seventh graders and 150 eighth graders in the school, and 36 of the club members are eighth graders. Which grade is more likely to join the club? Explain with percents.

Problem 15 Three grades (hard)

The table shows how 180 students get to school. Find the percent of each grade that walks, and describe the association between grade and walking.

Transportation	6th	7th	8th	Total
Walk	18	22	35	75
Bus	42	38	25	105
Total	60	60	60	180

Walk or bus, by grade.

Problem 16 Chess and math (hard)

Of 12 chess club members, 9 qualified for the math contest. Of 28 students who are not in the club, 7 qualified. Build the two-way table, find the percent of each group that qualified, and describe the association.

Problem 17 Tea or coffee (hard)

A survey of 200 people found that 60% were adults. Of the adults, 25% prefer tea and the rest prefer coffee. Of the 80 children, 75% prefer tea and the rest prefer coffee. Complete the two-way table and describe the association.

Problem 18 Check a claim (hard)

Mia says: "Of the 70 students who joined drama, 40 are eighth graders, so eighth graders are more likely to join." There are 200 eighth graders and 100 seventh graders; 30 seventh graders joined. Is Mia right?

Problem 19 Smartwatches (hard)

Of 150 people under 30, 105 own a smartwatch. Of 250 people aged 30 or older, 100 own one. Find the percent in each group who own one, the overall percent who own one to the nearest tenth, and describe the association.

Problem 20 Which percent? (hard)

A table shows 90 students in sports and 110 not in sports. Of those in sports, 36 are on the honor roll; of those not in sports, 24 are. A reporter wants to know whether students in sports are more likely to be on the honor roll. Which relative frequencies should be compared? Compute them.