

Two-Way Tables and Relative Frequencies

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

Name: _____ Date: _____ Class: _____

This test covers two-way tables, relative frequencies, and association between categorical variables. It has 8 questions worth 20 points and should take about 45 minutes. A calculator is allowed; round percents as directed and explain each conclusion in a sentence.

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

Time: 45 minutes · 8 questions · Total: 20 points · Calculator: as allowed by your teacher

Question 1 Complete the totals (2 points)

A survey asked 90 students about a part-time job and playing a sport.

Part-time job	Plays a sport	No sport	Total
Has a job	21	14	?
No job	29	26	?
Total	?	?	?

Totals are missing.

- Find the row totals. (1 point)
- Find the column totals and the grand total. (1 point)

Question 2 Row relative frequencies (3 points)

Use the completed table from Question 1, which covers all 90 students, with 35 students who have a job. Round to the nearest percent.

- What percent of students with a job play a sport? (1 point)
- What percent of students without a job play a sport? (1 point)
- Is there a strong association between having a job and playing a sport? Explain. (1 point)

Question 3 Column relative frequencies (3 points)

Use the completed table from Question 1, where 50 students play a sport and 40 do not.

- Of the students who play a sport, what percent have a job? (1 point)
- Of the students who do not play a sport, what percent have a job? (1 point)
- Explain how these percents differ from your answers to Question 2. (1 point)

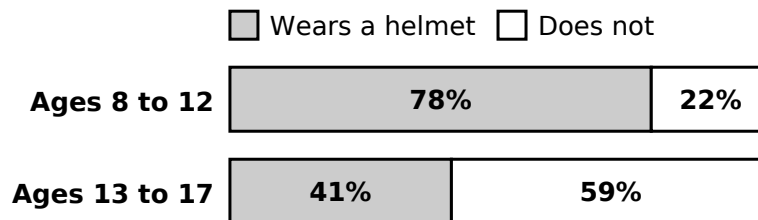
Question 4 Build a table from a list (3 points)

Twelve students were asked which pet they prefer and whether they have a sibling. The pairs (pet, sibling) are: (D, Y), (C, N), (D, Y), (D, N), (C, Y), (D, Y), (C, N), (D, Y), (C, N), (D, N), (C, Y), (D, Y). Here D means dogs, C means cats, Y means yes, N means no.

- Make a two-way table of the results. (2 points)
- Add row and column totals. (1 point)

Question 5 Segmented bars (3 points)

The segmented bars show helmet use among two age groups.



Helmet use while biking, by age group.

- Which group is more likely to wear a helmet? (1 point)
- Is there an association between age group and helmet use? Explain. (2 points)

Question 6 Evaluate a claim (2 points)

Ben says: "Of the 90 people who bought season passes, 54 are adults, so adults are more likely to buy a pass." There are 300 adults and 150 youths in the survey, and 36 youths bought passes. Is Ben correct?

Question 7 Fill in the table (2 points)

A two-way table has grand total 160, row totals 90 and 70, column totals 100 and 60, and the top-left cell is 55. Find the other three cells.

Question 8 No association (2 points)

In a two-way table, the row relative frequencies for the two rows are 52% and 51%. What does this suggest about the two variables? Explain.