Interpreting Relative Frequencies (page 1)

Relative frequency is the ratio of the value of a subtotal to the value of the total, expressed as a decimal or percent. A two-way table can show relative frequencies for rows or for columns, rather than the actual values. You can determine possible associations between variables by analyzing the relative frequencies.

Example: Consider a class of 50 students. There are 20 boys and 30 girls. 5 boys wear glasses and 18 girls wear glasses. Use a two-way table to display the frequencies.

	Glasses	No Glasses	Total
Boys	5	15	20
Girls	18	12	30
Total	23	27	50

	Glasses	No Glasses	Total
Boys	$\frac{5}{50}=.1\,or\,10\%$	$\frac{15}{50}=.3\,or\,30\%$	$\frac{20}{50}=.4\,or\,40\%$
Girls	$\frac{18}{50}=.36\,or\,36\%$	$\frac{12}{50}=.24\,or\,24\%$	$\frac{30}{50}=.6\,or\,60\%$
Total	$\frac{23}{50}=.46\,or\,46\%$	$\frac{27}{50}=.54\,or\,54\%$	$\frac{50}{50}=1\,or\,100\%$

To find the relative frequency for the overall total, find the ratio for each cell by dividing the value by 50.

To find the relative frequencies by *row (distribution of the wearing of glasses)*, write the ratios of each value to the *total for the row*.

	Glasses	No Glasses	Total
Boys	$\frac{5}{20}=.25\,or\,25\%$	$\frac{15}{20}=.75\,or\,75\%$	$\frac{20}{20}=1\,or\,100\%$
Girls	$\frac{18}{30}=.6\,or\,60\%$	$\frac{12}{30}=.4\,or\,40\%$	$\frac{30}{30}=1\,or\,100\%$

a) If you are looking at a boy, there is a better chance that he _____wearing glasses.
b) More girls _____glasses.

	Glasses	No Glasses
Boys	$\frac{5}{23}\approx.22\,or\,22\%$	$\frac{15}{27}=.56\,or\,56\%$
Girls	$\frac{18}{23}=.78\,or\,78\%$	$\frac{12}{27}=.44\,or\,44\%$
Total	$\frac{23}{23}=1\,or\,100\%$	$\frac{27}{27}=1\,or\,100\%$

To find the relative frequencies by *column (distribution of the genders)*, write the ratios of each value to the total (in that column). Round decimals to the nearest hundredth.

c) More _____ than _____wear glasses.
d) Looking at those that do not wear glasses, the distribution is somewhat_____with slightly more _____not wearing glasses.

Interpreting Relative Frequencies (page 2)

1. The United States Senate has 100 members. 44 are Democrats. On a recent bill, there were 53 YEAs; of these YEAs, 32 votes were Republicans. Complete the two-way table.

	Yes ("YEA")	No ("NAY")	Total
Democrats			
Republicans			
Total			

Using the data in the above two-way table, determine if the following statements are true or false:

(a) Both Democrats and Republicans tended to favor the bill.

(b) More Republicans than Democrats voted NAY, so Republicans were more likely to oppose the bill that Democrats were.

(c) Republicans tended to vote YEA on the bill, while Democrats were more likely to vote NAY than YEA

2. A survey was taken of 8th graders regarding their participation in school clubs. The results are shown in the chart below. Use the results to complete the two-way table.

Student	Gender Male	Gender Female	Participate? Yes	Participate? No
A	✓		✓	
B	✓		✓	
C	✓			✓
D		✓	✓	
E	✓		✓	
F		✓		✓
G		✓	✓	
H		✓	✓	
I	✓		✓	
J	✓			✓
K		✓	✓	
L		✓	✓	
M	✓		✓	
N		✓		✓
O	✓			✓

Participate in a Club?	Gender Male	Gender Female
Yes		
No		

a) Complete the two-way relative frequency table to show the correct percentages in all cells.

	Male	Female	Total
Total			

b) Find the relative frequencies of students in the survey by column. Express your values as %.

	Male	Female
Total		

c) State whether the results of the survey provide evidence that if you are an 8th grade male you would more likely be a member of a club than not. Explain your answer.