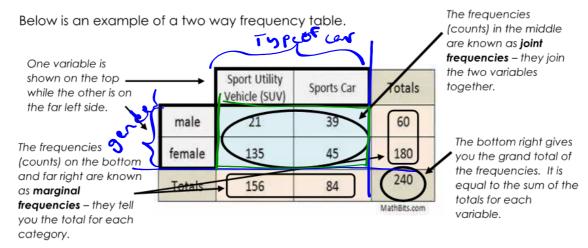
## Good morning!

- 1. "Here"
- 2. Finish comparing data
- 3. Notes on two-way tables

## **Two Way Frequency Tables**

A **two way table** is a useful way to organize data that can be categorized by two variables.



The following table shows the results of a poll of randomly selected high school students and their preference for either math or English. Before answering the questions below, calculate the marginal frequencies and grand total.

	9 <sup>th</sup> Grade	10 <sup>th</sup> Grade	11 <sup>th</sup> Grade	12 <sup>th</sup> Grade	Total
Math	10	12	11	8	41
English	12	11	8	8	39
Total	22	23	19	10	80

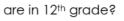
1. How many students are in 11th grade?

9

2. How many students are in 9<sup>th</sup> grade and prefer math?



3. How many students prefer English a



4. How many students are there total?



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1) The table below shows the results from a survey given to freshmen at Harrison. Fill in the missing values into the table below and then answer the following questions:

9th Grader's School Transportation Survey

	Male	Female	Total
Walk	34	46	86
Car	28	トフ	45
Bus	15	12	27
Bike	52	17	69
Total	129	92	22

a. How many students are there total?

b. How many 9th boys walk to school?

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c. How many 9th girls ride their bike to school?

d. How many males took the survey?

2) The table below represents the favorite meals of 9th and 10th graders. Use the table to answer the following questions.

	Favorite Meals of Students				
	Burgers	Chicken Nuggets	Pizza	Salad Bar	Total
9th grade	4	1	3	5	13
10th grade	3	7	3	4	17
Total	7	8	6	9	30
	10th grade	9th grade 4 10th grade 3	Burgers Chicken Nuggets  9th grade 4 1  10th grade 3 7	Burgers Chicken Nuggets Pizza 9th grade 4 1 3 10th grade 3 7 3	Burgers         Chicken Nuggets         Pizza         Salad Bar           9th grade         4         1         3         5           10th grade         3         7         3         4

a. How many 9th graders participated in the survey?

d. Which meal is the least favorite of all students? Pizza

b. How many students prefer chicken nuggets?

e. Which meal is the least favorite of 9th graders?

c. How many students prefer burgers?

f. Which meal is most favorite of 10th

Ch. nug.

## Relative Frequencies

A **relative frequency** is the frequency that an event occurs divided by the total number of events.

Example: If your team has won 9 games from a total of 12 games played...

The frequency of winning is  $\frac{9}{12}$ .

The percent of games won is  $\frac{75\%}{12}$ .

The relative frequency of winning is  $\frac{9}{12}$ .

Below is the two-way frequency table that we initially looked at. It shows the results of a poll of randomly selected high school students and their preference for either math or English.

	9 <sup>th</sup> Grade	10 <sup>th</sup> Grade	11 <sup>th</sup> Grade	12 <sup>th</sup> Grade	Total
Math	10	12	11	8	41
English	12	11	8	8	39
Total	22	23	19	16	80

On the table below, use the information from the original table to calculate the joint relative frequencies and marginal relative frequencies.

To calculate **joint relative frequencies**, take each joint frequency and divide by the grand total. Round to the nearest thousandth for this example.

The calculate **marginal relative frequencies**, find the sum of the joint relative frequencies for each row and column. Round to the nearest thousandth for this example.

	9 <sup>th</sup> Grade	10 <sup>th</sup> Grade	11 <sup>th</sup> Grade	12 <sup>th</sup> Grade	Total
Math	80 = 8 = .125	$\frac{12}{80} = \frac{3}{20} = .15$	11 = .138	8 1 - 10 1	.505
English	12 = .15	11 = · 138	<u>8</u> ₹0 - •1	30 - · ·	.450
Total	.275	.288	. 238	.2	1.00

a) What percent of students are in 10th grade and like English?

b) What percent of students like math?

c) What percent of students like Math and are in 12th grade?

d) What percent of those surveyed were seniors?

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## Practice with Relative Frequencies

1) One hundred people who frequently get migraine headaches were chosen to participate in a study of new anti-headache medicine. Some of the participants were given the medicine; others were not. After one week, the participants were asked if they got a headache during the week. The two way frequency table summarizes the results. Create a table showing the joint relative frequencies and marginal relative frequencies. Round to the nearest hundredth for this problem.

Frequencies					
	Took Medicine	Did NOT Take Medicine			
Headache	12	15	27		
No Headache	48	25	73		
	60	40	100		

Relative Frequencies						
	Took Medicine	Did No Take Medic	•			
Headache	.12	. 15		.27		
No Headache	.48	.25	)	.73		
	.4	. 4		1		

a. What is the relative frequency of participants that had a headache?

b. What is the relative frequency of participants that did NOT take the medicine AND had a headache?

2) Create a relative frequency table to represent the favorite movies of students.

		38	14	12	64			
Class	Class B	18	6	9	33			
	Class A	20	8	3	31			
		Comedy	Drama	Horror				
	Favorite Movies of Students							

a. What percent of people prefer to watch comedies?

b. What percent of people prefer to watch horror movies?

Favorite Movies of Students

		Comedy	Drama	Horror	
ass	Class A	204 = .31	.13 •	<del>.04</del> .6	奔59
ŏ	Class B	.28	.09	.14	.51
		.59	.22	.187	1
		l		.19	

c. What percent of people are from class A and prefer to watch drama movies?

13%

d. Which class prefers watching horrer movies?

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