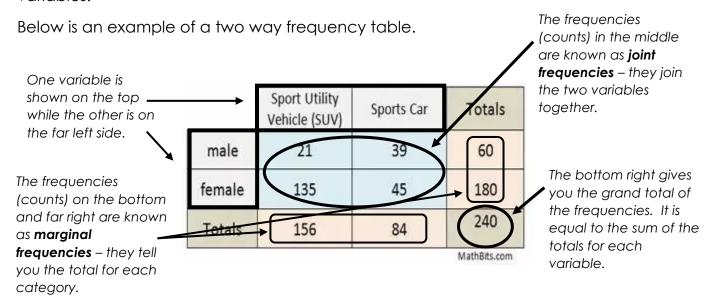
## Two Way Frequency Tables

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	
English	12	11	8	8	
Total					

- 1. How many students are in 11th grade?
- 3. How many students prefer English and are in 12<sup>th</sup> grade?
- 2. How many students are in 9<sup>th</sup> grade and prefer math?
- 4. How many students are there total?

## Two Way Frequency Tables Practice

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		46	
Car	28		45
Bus		12	27
Bike		17	69
Total	129	92	

- a. How many students are there total?
- b. How many 9th boys walk to school?
- c. How many 9<sup>th</sup> girls ride their bike to school?
- d. How many males took the survey?

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

Favorite Meals of Students

		Burgers	Chicken Nuggets	Pizza	Salad Bar	Total
evel	9th grade	4	1	3	5	13
rade Le	10th grade	3	7	3	4	17
Gra	Total	7	8	6	9	30

- a. How many 9<sup>th</sup> graders participated in the survey?
- d. Which meal is the least favorite of all students?
- b. How many students prefer chicken nuggets?
- e. Which meal is the least favorite of 9<sup>th</sup> graders?
- c. How many students prefer burgers?
- f. Which meal is most favorite of 10<sup>th</sup> graders?

## Relative Frequencies

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

The **frequency** of winning is \_\_\_\_\_\_.

The **percent** of games won is \_\_\_\_\_\_.

The **relative frequency** of winning is \_\_\_\_\_

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					
English					
Total					

- 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?

## 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.

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	Took Medicine	Did NOT Take Medicine			
Headache	12	15			
No Headache	48	25			

Relative Frequencies

_	110 1011 0 110 0 0 110 0					
	Took Medicine	Did NOT Take Medicine				
Headache						
No Headache						

- 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.

**Favorite Movies of Students** 

		Comedy	Drama	Horror
SSC	Class A	20	8	3
ö	Class B	18	6	9

- 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
SSE	Class A			
Ö	Class B			

- c. What percent of people are from class A and prefer to watch drama movies?
- d. Which class prefers watching horror movies?