

**DO NOW**

1. Jenna took a survey of her senior class to see whether they preferred pizza or burgers. The results are summarized in the table below. Of the people who preferred burgers, to the nearest *tenth*, what percentages were female?

Handwritten calculation: 
$$\frac{\text{Females}}{\text{total}} = \frac{26}{68} = 38.2$$

	Pizza	Burgers
Male	23	42
Female	31	26
total	54	68

**AIM: Two-Way Frequency Tables – Day II**

Conditional Relative Frequency probabilities are not based on the whole population, but rather a specific subgroup within the whole population that is represented by a **row total** or a **column total**.

**THE GIVEN CONDITION IS ALWAYS YOUR DENOMINATOR!**

**Conditional Relative Frequency for Rows:**

	Sport Utility Vehicle (SUV)	Sports Car	Totals
male	$\frac{21}{60} = 0.35$	$\frac{39}{60} = 0.65$	$\frac{60}{60} = 1.00$
female	$\frac{135}{180} = 0.75$	$\frac{45}{180} = 0.25$	$\frac{180}{180} = 1.00$
Totals	$\frac{156}{240} = 0.65$	$\frac{84}{240} = 0.35$	$\frac{240}{240} = 1.00$

**Conditional relative frequencies**

**Row Relative Frequencies -**  
Divide male row by 60.  
Divide female row by 180.  
Divide Totals row by 240.

MathBits.com

**Conditional Relative Frequency for Columns:**

	Sport Utility Vehicle (SUV)	Sports Car	Totals
male	$\frac{21}{156} = 0.13$	$\frac{39}{84} = 0.46$	$\frac{60}{240} = 0.25$
female	$\frac{135}{156} = 0.87$	$\frac{45}{84} = 0.54$	$\frac{180}{240} = 0.75$
Totals	$\frac{156}{156} = 1.00$	$\frac{84}{84} = 1.00$	$\frac{240}{240} = 1.00$

**Conditional relative frequencies**

**Column Relative Frequencies -**  
Divide SUV column by 156.  
Divide Sports Car column by 84.  
Divide Totals column by 240.

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1. A survey is conducted among school students. 50 students are randomly selected and they are asked, whether they prefer dogs, cats or other pets. The table given below shows the results of the survey. Use the above table to find each conditional relative frequency.

Preferred Pet Gender	Dog	Cat	Other	TOTAL
Girl	12	6	10	28
Boy	10	9	3	22
Total	22	15	13	50

- a. Find the conditional relative frequency that a student surveyed prefers cats as pets, given that the student is a girl.

$$\frac{6}{28} = .21 = 21\%$$

- b. Given that the student prefers dogs as pets, find the conditional relative frequency that a student surveyed is a girl.

$$\frac{12}{22} = .55 = 55\%$$

2. A survey is made among 100 students in a middle school. They are asked how they travel to school. The table given below shows the results of the survey. Use the above table to find each conditional relative frequency.

Transport Gender	Car	Bus	Other Transport	TOTAL
Girl	22	38	40	100
Boy	25	34	41	100
Total	47	72	81	200

- a) Find the conditional relative frequency that a student surveyed prefers car, given that the student is a boy.

$$\frac{25}{100} = .25 = 25\%$$

- b) Given that the student prefers bus, find the conditional relative frequency that a student surveyed is a boy,

$$\frac{34}{72} = .47 = 47\%$$

3. Complete the two-way table below for the gender of students taking each course using conditional relative frequencies. The data is based on the senior English elective taken by students at Buchanan High School

**Conditional Relative Frequencies**

	Gender		Total
	Boys	Girls	
Creative Writing	65	150	215
Visual Storytelling	70	120	190
Newspaper Journalism	88	56	144
Graphic Design	74	136	210
Total	297	462	759

What is the conditional relative frequency of the number of girls enrolled in Visual Storytelling?

$$\frac{120}{462} = 25.97\%$$

4. A survey is made among 100 people in three major cities. They are asked, how they travel to work. The table given below shows the results of the survey. Use the above table to find each conditional relative frequency.

	Car	Train	Walk	Total
New York	5	25	10	40
Los Angeles	18	12	5	35
Chicago	8	14	3	25
Total	31	51	18	100

Given that a person rides a train to work, what is the conditional relative frequency that they live in New York?

$$\frac{25}{51} = .49 = 49\%$$

5. A statistics class surveyed some students during one lunch period to obtain opinions about television programming preferences. The results of the survey are summarized in the table below.

Programming Preferences		
	Comedy	Drama
Male	70	35
Female	48	42

= 105

Based on the sample, predict how many of the school's 351 males would prefer comedy. Justify your answer.

$$\frac{70}{105} = .66$$

66%

$$351 \times .66$$

234 males

6. The school newspaper surveyed the student body for an article about club membership. The table below shows the number of students in each grade level who belong to one or more clubs.

	1 Club	2 Clubs	3 or More Clubs
9 <sup>th</sup>	90	33	12
10 <sup>th</sup>	125	12	15
11 <sup>th</sup>	87	22	18
12 <sup>th</sup>	75	27	23

= 180

If there are 180 students in 9<sup>th</sup> grade, what percentage of 9<sup>th</sup> grade students belong to more than one club?

$$33 + 12 = 45 \quad \frac{45}{180} = .25 = 25\%$$

7. A survey of 100 students was taken. It was found that 60 students watched sports, and 34 of these students did not like pop music. Of the students who did not watch sports, 70% liked pop music. Complete the two-way frequency table.

	Watch Sports	Don't Watch Sports	Total
Like Pop	26	28	54
Don't Like Pop	34	12	46
Total	60	40	100

$$40 \times .70 = 28$$

8. Students were asked to name their favorite sport from a list of basketball, soccer, or tennis. The results are shown in the table below. What percent of the students chose soccer as their favorite sport?

(1) 39.6%

(3) 50.4%

(2) 41.4%

(4) 58.6%

	Basketball	Soccer	Tennis	Total
Girls	42	58	20	120
Boys	84	41	5	130
		99		250

9. High School, and college students. They were asked which of three different types of music they prefer on the radio: hip-hop, alternative, or classic rock. The results are summarized in the table below. What percent of college students prefer classic rock?

(1) 14%

(3) 33%

(2) 28%

(4) 58%

	Hip-Hop	Alternative	Classic Rock
Middle School	28	18	4
High School	22	22	6
College	16	20	14

50

10. A survey was given to 12th-grade students of West High School to determine the location for the senior class trip. The results are shown in the table below. To the *nearest percent*, what percent of the boys chose Niagara Falls?

1) 12

3) 44

(2) 24

4) 56

	Niagara Falls	Darien Lake	New York City
Boys	56	74	103
Girls	71	92	88

= 235