

## 2-Way Frequency Tables

EQ: How do I describe the probability of categorical data?

### **What am I learning today?**

How to create and analyze 2-category data tables

### **How will I show that I learned it?**

Create a relative frequency table and discuss the popularity of different options

## Vocabulary - Review

- Quantitative Data – Data that can be measured and is reported in a numerical form.
- Categorical/Qualitative Data – Data that can be observed but not measured and is sorted by categories.

2-way frequency tables are used to represent categorical data that each have 2 details. We assume that there is no overlap in these tables.

Example:

Participation in School Activities			
School Club	Gender		Totals
	Male	Female	
Band	12	21	33
Chorus	15	17	32
Chess	16	3	19
Latin	7	9	16
Yearbook	28	7	35
<b>Totals</b>	<b>78</b>	<b>57</b>	<b>135</b>

• 2-category #'s

• 1-category #'s

● Total

This is called a relative frequency table.

Participation in School Activities			
School Club	Gender		Totals
	Male	Female	
Band	8.9%	15.6%	24.5%
Chorus	11.1%	12.6%	23.7%
Chess	11.9%	2.2%	14.1%
Latin	5.2%	6.7%	11.9%
Yearbook	20.7%	5.2%	25.9%
<b>Totals</b>	<b>57.8%</b>	<b>42.3%</b>	<b>100%</b>

Will always be 100%

● - joint frequencies      ● - marginal frequencies

Joint Frequency =  $\frac{\text{2-category number}}{\text{total number}}$

Example: What is the joint frequency of a student who is male and in band?

$$\frac{12}{135} = 8.9\%$$

Marginal Frequency =  $\frac{\text{1-category number}}{\text{total number}}$

Example: What is the marginal frequency of a student who is in yearbook?

$$\frac{35}{135} = 25.9\%$$

Conditional Frequency =  $\frac{\text{2-category number}}{\text{1-category number}}$

Example: What is the conditional frequency that a male is in Latin?

$$\frac{7}{78} = 8.97\%$$

Grade	Hours spent on homework		
	0-2	2-4	More than 4
9	38	12	2
10	21	25	9
11	14	18	20

Total

52

55

52

159

Total

73

55

31

What percentage of students were 9th graders who worked more than 4 hours on homework?

$$\frac{2}{159} = 1.25\%$$

Type of frequency?

joint

What percentage of students were 11th graders?

Type of frequency?

marginal

$$\frac{52}{159} = 32.7\%$$

2 cat total

What percentage of students who worked 0-2 hours on homework were 10th graders?

$$\frac{21}{73} = 28.76\%$$

Type of frequency?

conditional

Gender	Preferred sport		
	Baseball	Soccer	Basketball
Male	49	52	16
Female	23	64	33

Total

117

120

Total

72

116

49

237

What percentage of the people surveyed were female?

Type of frequency?

marginal

$$\frac{120}{237} = 50.63\%$$

What percentage of males preferred soccer?

Type of frequency?

conditional

$$\frac{52}{117} = 44.44\%$$

What percentage of the people surveyed were females who preferred basketball?

Type of frequency?

joint

$$\frac{33}{237} = 13.92\%$$

