

## Two-Way Tables

### Vocabulary:

**Two-Way frequency table:** a table listing two categorical variables

**Joint Relative Frequency:** divide a frequency that is not in the total row or the total column by the grand total

**Marginal relative frequency:** divide a row total or a column total by the grand total

**Two-Way Relative Frequency Table:** displays both the joint relative and marginal relative frequencies

**Conditional relative frequency:** divide a frequency that is NOT in the total row or total column by the frequency's row total or column total

### Creating a relative frequency table:

Ms. Bonenfant asked 20 randomly selected students whether they preferred dogs, cats, or other pets.

Preferred Pet	Dog	Cat	Other	Total
Frequency	18	12	10	40
Relative Frequency	$\frac{18}{40} = 0.45$	$\frac{12}{40} = 0.3$	$\frac{10}{40} = 0.25$	$\frac{40}{40} = 1$
Relative Frequency Percent	45%	30%	25%	100%

To find:  
divide the  
amount by  
the total

Then Ms. Bonenfant recorded the gender of each student and their preference.

Preferred Pet	Dog	Cat	Other	Total
Boys	10	5	9	
Girls	8	7		16
Totals	18		10	40

Fill in the rest of the table.

How many total students took the survey?

How many **students** said they like dogs as pets?

How many **boys** said they like dogs as pets?

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

Number of girls who prefer cats:

Number of girls:

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

Number of girls who prefer cats:

Number of students who prefer cats:

Creating a two-way relative frequency table.

Preferred Pet	Dog	Cat	Other	Total
Boys	$\frac{10}{40} = .25$			
Girls	$\frac{8}{40} = .2$			
Totals				

Fill in the rest of the table.

Find the joint relative frequency of students surveyed who are girls and prefer dogs as pets.

*To answer this, you have to look at only the girls who picked dogs: 0.2*

Find the joint relative frequency of students surveyed who are boys and prefer cats as pets.

*To answer this, you have to look at only the boys who picked cats.*

Find the marginal relative frequency of students surveyed who prefer dogs as pets and then prefer cats as pets.

*To answer this, you are now looking at all students (boys and girls) who prefer dogs.*

*Then a separate question: you have to look at all students (boys and girls) who prefer cats.*